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TECHNICAL MEMORANDUM
BDRL-TM-72-002

APPROXIMATIONS OF DOWNWIND DISTANCE FOR A GIVEN THREAT FROM AN ELEVATED LINE SOURCE

II. DOMAIN OF INVERSE RELATIONSHIP BETWEEN F_2 AND Z FOR VALUES OF β BETWEEN .6 AND 1.6 AND VALUES OF T OF 36 OR LESS.

By

Michael J. Evans

June 1972

U. S. ARMY

BIOLOGICAL DEFENSE RESEARCH LABORATORY

ANALYTICAL SCIENCES OFFICE

DUGWAY, UTAH 84022

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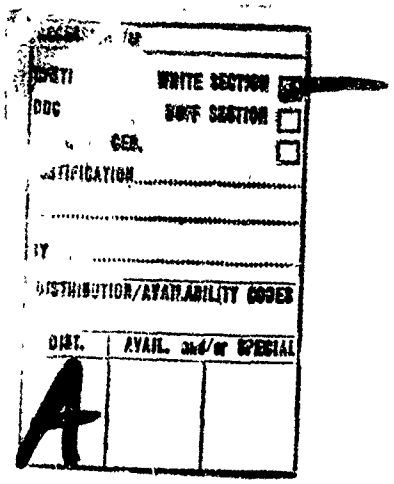

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13. ABSTRACT

The initial steps previously described for a limited number of values for β are expanded. To determine the downwind distance corresponding to a given casualty level, an intermediate variable Z is determined from parameters β and T. From the variable Z, a second intermediate variable F_2 must also be determined. For situations where β is between .6 and 1.6 and T is 36 or less, the domain of definition of the relationship F_2 has to Z is approximated, i.e., the values of Z that give rise to values of F_2 are determined.

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TECHNICAL MEMORANDUM

APPROXIMATIONS OF DOWNWIND DISTANCE FOR A GIVEN THREAT FROM AN ELEVATED LINE SOURCE

II. DOMAIN OF INVERSE RELATIONSHIP BETWEEN F_2 AND Z FOR VALUES OF β BETWEEN .5 AND 1.6 AND VALUES OF T OF 36 OR LESS.

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IV
~~III~~

ABSTRACT

The initial steps previously described for a limited number of values for β are expanded. To determine the downwind distance corresponding to a given casualty level, an intermediate variable Z is determined from parameters β and T. From the variable Z, a second intermediate variable F_2 must also be determined. For situations where β is between .6 and 1.6 and T is 36 or less, the domain of definition of the relationship F_2 has to Z is approximated, i.e., the values of Z that give rise to values of F_2 are determined.

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1. INTRODUCTION

In a previous study[1] the problem of finding a method to estimate the downwind distance for a given threat from an elevated line source which would be adaptable to a programmable calculator was discussed. This was called the problem of the "backward" solution. As indicated in the previous study, one of the critical areas is the approximation of the domain of definition of the inverse relationship between F_2 and Z. A method to approximate this domain was given for the situations where T is 30 or less, and $\beta = .833...$ or $\beta = .875$. This was done by approximating Z_{max}, the maximum value that Z can assume for a given β and T.

This same problem has been studied in a much broader sense by allowing β to assume any value between .6 and 1.6, and approximating the domain of definition of the inverse relationship between F_2 and Z by way of approximating Z_{max}. In this report one formula is given, which approximates Z_{max}, given any value of T between .001 and 36, and any value of β between .6 and 1.6. For values of T less than .001, the constant approximattion proposed in Section 2 of the previous study[1] is recommended.

[1] See reference 1.

2. AN APPROXIMATION FOR THE CASE $.001 \leq T \leq 36$

Proceeding as in the previous study[1], an approximation, call it Z_{max*}, to Z_{max} can be made by first finding an approximation, call it F_{2m*}, to F_{2m}, the value of F_2 at which Z assumes its maximum value Z_{max}. Then Z_{max*} is defined to be

$$Z_{max*} = F_{2m*}^{-\beta} e^{-F_{2m*}^{-2\beta}} e^{-TF_{2m*}}$$

Data were assembled in order to find an expression for F_{2m*} (first three columns of Table A). For any particular values of β and T, F_{2m} was determined correct to three decimal places, strictly by examining the values of Z around its maximum, and the corresponding values of F_2. With these three columns of data, a series of multiple regressions was conducted, attempting to find a formula for an approximation to F_{2m} in terms of β and T. The following formula is the end product of this investigation:

$$F_{2m*} = a_0 + a_1 T^{1/4} + a_2 T^{5/4} + a_3 \frac{1}{T^{1/2}} + a_4 \frac{1}{T^{3/4}} + a_5 \frac{1}{T^{3/2}} + a_6 \frac{1}{\beta T^{1/4}}$$

$$+ a_7 \frac{1}{\beta T^{1/2}} + a_8 \beta^{1/4} + a_9 \beta^{1/2}$$

$$+ \sum_{i=0}^{7} \sum_{j=0}^{3} b_{ij} \beta^j \left[\ln\left(T + \frac{\beta^2 T}{4}\right) \right]^i$$

where

$a_0 = -8.42051 \times 10^{0}$

$a_1 = -4.42953 \times 10^{-1}$

$a_2 = 3.07905 \times 10^{-3}$

$a_3 = -1.50699 \times 10^{-1}$

$a_4 = 2.71018 \times 10^{-2}$

[1] See reference 1.

$a_5 = -1.98197 \times 10^{-5}$

$a_6 = 6.35919 \times 10^{-1}$

$a_7 = -7.93436 \times 10^{-2}$

$a_8 = 1.59644 \times 10^{1}$

$a_9 = -6.54011 \times 10^{0}$

$b_{00} = -6.39818531826 \times 10^{-1}$

$b_{01} = 1.60668159469 \times 10^{0}$

$b_{02} = -1.29269367557 \times 10^{0}$

$b_{03} = 3.38940935444 \times 10^{-1}$

$b_{10} = 9.75667625190 \times 10^{-2}$

$b_{11} = -4.52372554215 \times 10^{-1}$

$b_{12} = 4.60145889183 \times 10^{-1}$

$b_{13} = -1.31250714463 \times 10^{-1}$

$b_{20} = 1.60627896026 \times 10^{-1}$

$b_{21} = -3.68303780643 \times 10^{-1}$

$b_{22} = 2.62286078697 \times 10^{-1}$

$b_{23} = -6.06964525058 \times 10^{-2}$

$b_{30} = 1.04534994545 \times 10^{-5}$

$b_{31} = 3.24577100249 \times 10^{-2}$

$b_{32} = -3.99022673036 \times 10^{-2}$

$b_{33} = 1.20989616679 \times 10^{-2}$

$b_{40} = -1.06065905070 \times 10^{-2}$

$b_{41} = 2.55606661311 \times 10^{-2}$

$b_{42} = -1.81327433244 \times 10^{-2}$

$$b_{43} = 4.19578636363 \times 10^{-3}$$

$$b_{50} = -2.66444817568 \times 10^{-4}$$

$$b_{51} = -6.49540010470 \times 10^{-4}$$

$$b_{52} = 1.10844058340 \times 10^{-2}$$

$$b_{53} = -3.66718975653 \times 10^{-4}$$

$$b_{60} = 2.73250116167 \times 10^{-4}$$

$$b_{61} = -7.67150044510 \times 10^{-4}$$

$$b_{62} = 5.80376870276 \times 10^{-4}$$

$$b_{63} = -1.40798966135 \times 10^{-4}$$

$$b_{70} = 2.07759268633 \times 10^{-5}$$

$$b_{71} = -4.99850768588 \times 10^{-5}$$

$$b_{72} = 3.32047504834 \times 10^{-5}$$

$$b_{73} = -7.27842208300 \times 10^{-6}$$

The accuracy of this approximation is illustrated in Table A. F_{2m*} rounded to three decimal places appears in column four. The relative error of this approximation to F_{2m} appears in column five. The Z_{max} and Z_{max*} values found in columns six and seven, respectively, were computed from the rounded figures in columns three and four, respectively, and then rounded to three significant digits. The relative error of the approximation Z_{max*} to Z_{max} appears in the final column, and was computed on the basis of 12 significant digits for Z_{max} and Z_{max*}.

Table B summarizes the accuracy of the approximation in that the second column represents the maximum relative error observed in checking the approximation with the test data (Table A).

As an application of this approximation technique, it was applied to the data available from the previous study[1], namely, $.01 \leq T \leq 30$, $\beta = .833...$, and $\beta_1 = .875$. Table C shows the results of this application. Table C was devised in the same format as Table A. The final column shows that the approximation compares favorably with the approximation established in the previous study[1]. The maximum observed relative error in the estimation of Z_{max} is .0161 percent for $\beta = .833...$, and .0252 percent for $\beta = .875$.

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR REIATIVE ERRORS SHEET 1

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.6	.001	1.777	1.770	.394%	4.28×10^{-1}	4.28×10^{-1}	.0006%
.6	.002	1.773	1.782	.508%	4.27×10^{-1}	4.27×10^{-1}	.0009%
.6	.003	1.769	1.770	.057%	4.27×10^{-1}	4.27×10^{-1}	.0000%
.6	.004	1.765	1.761	.227%	4.26×10^{-1}	4.26×10^{-1}	.0001%
.6	.006	1.756	1.752	.228%	4.24×10^{-1}	4.24×10^{-1}	.0002%
.6	.008	1.748	1.745	.172%	4.23×10^{-1}	4.23×10^{-1}	.0001%
.6	.010	1.740	1.739	.057%	4.21×10^{-1}	4.21×10^{-1}	.0000%
.6	.015	1.720	1.724	.233%	4.18×10^{-1}	4.18×10^{-1}	.0002%
.6	.020	1.702	1.707	.294%	4.14×10^{-1}	4.14×10^{-1}	.0004%
.6	.025	1.684	1.690	.356%	4.11×10^{-1}	4.11×10^{-1}	.0005%
.6	.030	1.667	1.673	.360%	4.07×10^{-1}	4.07×10^{-1}	.0006%
.6	.035	1.650	1.656	.364%	4.04×10^{-1}	4.04×10^{-1}	.0005%
.6	.040	1.635	1.640	.306%	4.01×10^{-1}	4.01×10^{-1}	.0005%
.6	.045	1.619	1.625	.371%	3.97×10^{-1}	3.97×10^{-1}	.0005%
.6	.050	1.605	1.609	.269%	3.94×10^{-1}	3.94×10^{-1}	.0005%
.6	.055	1.591	1.595	.251%	3.91×10^{-1}	3.91×10^{-1}	.0003%
.6	.060	1.577	1.581	.254%	3.88×10^{-1}	3.88×10^{-1}	.0003%
.6	.065	1.564	1.567	.192%	3.85×10^{-1}	3.85×10^{-1}	.0002%
.6	.070	1.551	1.554	.193%	3.82×10^{-1}	3.82×10^{-1}	.0002%
.6	.075	1.539	1.541	.130%	3.79×10^{-1}	3.79×10^{-1}	.0001%
.6	.080	1.527	1.529	.131%	3.76×10^{-1}	3.76×10^{-1}	.0001%
.6	.085	1.515	1.517	.132%	3.73×10^{-1}	3.73×10^{-1}	.0001%
.6	.090	1.504	1.506	.133%	3.70×10^{-1}	3.70×10^{-1}	.0001%
.6	.095	1.493	1.495	.134%	3.68×10^{-1}	3.68×10^{-1}	.0001%
.6	.100	1.482	1.484	.135%	3.65×10^{-1}	3.65×10^{-1}	.0001%
.6	.150	1.390	1.391	.072%	3.40×10^{-1}	3.40×10^{-1}	.0000%
.6	.200	1.316	1.318	.152%	3.18×10^{-1}	3.18×10^{-1}	.0002%
.6	.250	1.255	1.257	.159%	2.98×10^{-1}	2.98×10^{-1}	.0002%
.6	.300	1.203	1.207	.333%	2.80×10^{-1}	2.80×10^{-1}	.0007%
.6	.350	1.159	1.163	.345%	2.64×10^{-1}	2.64×10^{-1}	.0011%
.6	.400	1.120	1.124	.357%	2.49×10^{-1}	2.49×10^{-1}	.0013%
.6	.450	1.085	1.090	.461%	2.36×10^{-1}	2.35×10^{-1}	.0020%
.6	.500	1.054	1.059	.474%	2.24×10^{-1}	2.24×10^{-1}	.0023%
.6	.550	1.026	1.031	.487%	2.12×10^{-1}	2.12×10^{-1}	.0027%
.6	.600	1.000	1.005	.500%	2.02×10^{-1}	2.02×10^{-1}	.0025%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 2

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.6	.650	.977	.982	.512%	1.92×10^{-1}	1.92×10^{-1}	.0033%
.6	.700	.955	.960	.524%	1.83×10^{-1}	1.83×10^{-1}	.0032%
.6	.750	.935	.940	.535%	1.75×10^{-1}	1.75×10^{-1}	.0035%
.6	.800	.916	.921	.546%	1.67×10^{-1}	1.67×10^{-1}	.0032%
.6	.850	.899	.904	.556%	1.59×10^{-1}	1.59×10^{-1}	.0040%
.6	.900	.882	.887	.567%	1.52×10^{-1}	1.52×10^{-1}	.0032%
.6	.950	.867	.872	.577%	1.46×10^{-1}	1.46×10^{-1}	.0039%
.6	1.000	.853	.857	.469%	1.40×10^{-1}	1.40×10^{-1}	.0032%
.6	1.500	.743	.746	.404%	9.40×10^{-2}	9.40×10^{-2}	.0028%
.6	2.000	.670	.671	.149%	6.61×10^{-2}	6.61×10^{-2}	.0003%
.6	2.500	.617	.617	.000%	4.79×10^{-2}	4.79×10^{-2}	.0000%
.6	3.000	.576	.576	.000%	3.56×10^{-2}	3.56×10^{-2}	.0000%
.6	3.500	.543	.542	.184%	2.69×10^{-2}	2.69×10^{-2}	.0002%
.6	4.000	.515	.514	.194%	2.07×10^{-2}	2.07×10^{-2}	.0011%
.6	4.500	.492	.491	.203%	1.61×10^{-2}	1.61×10^{-2}	.0005%
.6	5.000	.472	.471	.212%	1.26×10^{-2}	1.26×10^{-2}	.0001%
.6	6.000	.438	.438	.000%	8.02×10^{-3}	8.02×10^{-3}	.0000%
.6	7.000	.412	.411	.243%	5.25×10^{-3}	5.25×10^{-3}	.0006%
.6	8.000	.390	.390	.000%	3.52×10^{-3}	3.52×10^{-3}	.0000%
.6	9.000	.371	.372	.270%	2.40×10^{-3}	2.40×10^{-3}	.0016%
.6	10.000	.355	.356	.282%	1.67×10^{-3}	1.67×10^{-3}	.0011%
.6	12.000	.329	.330	.304%	8.44×10^{-4}	8.44×10^{-4}	.0020%
.6	14.000	.309	.309	.000%	4.46×10^{-4}	4.46×10^{-4}	.0000%
.6	16.000	.292	.292	.000%	2.45×10^{-4}	2.45×10^{-4}	.0000%
.6	18.000	.277	.278	.361%	1.39×10^{-4}	1.39×10^{-4}	.0025%
.6	20.000	.265	.265	.000%	8.07×10^{-5}	8.07×10^{-5}	.0000%
.6	22.000	.255	.254	.392%	4.80×10^{-5}	4.80×10^{-5}	.0002%
.6	24.000	.245	.244	.408%	2.91×10^{-5}	2.91×10^{-5}	.0151%
.6	26.000	.237	.236	.422%	1.80×10^{-5}	1.80×10^{-5}	.0089%
.6	28.000	.229	.228	.437%	1.13×10^{-5}	1.13×10^{-5}	.0251%
.6	30.000	.223	.221	.897%	7.18×10^{-6}	7.18×10^{-6}	.0397%
.6	32.000	.216	.215	.463%	4.63×10^{-6}	4.63×10^{-6}	.0339%
.6	34.000	.211	.209	.948%	3.02×10^{-6}	3.02×10^{-6}	.0646%
.6	36.000	.206	.204	.971%	1.99×10^{-6}	1.99×10^{-6}	.0555%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 3

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.7	.001	1.638	1.629	.549%	4.28×10^{-1}	4.28×10^{-1}	.0015%
.7	.002	1.635	1.640	.306%	4.27×10^{-1}	4.27×10^{-1}	.0004%
.7	.003	1.633	1.629	.245%	4.27×10^{-1}	4.27×10^{-1}	.0002%
.7	.004	1.630	1.623	.429%	4.26×10^{-1}	4.26×10^{-1}	.0009%
.7	.006	1.625	1.616	.554%	4.25×10^{-1}	4.25×10^{-1}	.0014%
.7	.008	1.619	1.612	.432%	4.23×10^{-1}	4.23×10^{-1}	.0010%
.7	.010	1.614	1.608	.372%	4.22×10^{-1}	4.22×10^{-1}	.0007%
.7	.015	1.602	1.599	.187%	4.19×10^{-1}	4.19×10^{-1}	.0001%
.7	.020	1.589	1.588	.063%	4.15×10^{-1}	4.15×10^{-1}	.0000%
.7	.025	1.578	1.577	.063%	4.12×10^{-1}	4.12×10^{-1}	.0000%
.7	.030	1.566	1.566	.000%	4.09×10^{-1}	4.09×10^{-1}	.0000%
.7	.035	1.555	1.554	.064%	4.06×10^{-1}	4.06×10^{-1}	.0000%
.7	.040	1.544	1.543	.065%	4.02×10^{-1}	4.02×10^{-1}	.0000%
.7	.045	1.534	1.532	.130%	3.99×10^{-1}	3.99×10^{-1}	.0001%
.7	.050	1.524	1.521	.197%	3.96×10^{-1}	3.96×10^{-1}	.0002%
.7	.055	1.514	1.510	.264%	3.93×10^{-1}	3.93×10^{-1}	.0004%
.7	.060	1.505	1.500	.332%	3.90×10^{-1}	3.90×10^{-1}	.0005%
.7	.065	1.495	1.490	.334%	3.87×10^{-1}	3.87×10^{-1}	.0007%
.7	.070	1.486	1.481	.336%	3.85×10^{-1}	3.85×10^{-1}	.0007%
.7	.075	1.477	1.471	.406%	3.82×10^{-1}	3.82×10^{-1}	.0011%
.7	.080	1.469	1.462	.477%	3.79×10^{-1}	3.79×10^{-1}	.0013%
.7	.085	1.460	1.453	.479%	3.76×10^{-1}	3.76×10^{-1}	.0015%
.7	.090	1.452	1.445	.482%	3.73×10^{-1}	3.73×10^{-1}	.0015%
.7	.095	1.444	1.436	.554%	3.71×10^{-1}	3.71×10^{-1}	.0019%
.7	.100	1.436	1.428	.557%	3.68×10^{-1}	3.68×10^{-1}	.0020%
.7	.150	1.366	1.356	.732%	3.43×10^{-1}	3.43×10^{-1}	.0038%
.7	.200	1.308	1.298	.765%	3.21×10^{-1}	3.21×10^{-1}	.0045%
.7	.250	1.259	1.250	.715%	3.01×10^{-1}	3.01×10^{-1}	.0040%
.7	.300	1.216	1.208	.658%	2.83×10^{-1}	2.83×10^{-1}	.0040%
.7	.350	1.178	1.172	.509%	2.67×10^{-1}	2.67×10^{-1}	.0030%
.7	.400	1.145	1.139	.524%	2.52×10^{-1}	2.52×10^{-1}	.0030%
.7	.450	1.115	1.110	.448%	2.38×10^{-1}	2.38×10^{-1}	.0024%
.7	.500	1.088	1.084	.368%	2.25×10^{-1}	2.25×10^{-1}	.0016%
.7	.550	1.063	1.059	.376%	2.13×10^{-1}	2.13×10^{-1}	.0019%
.7	.600	1.041	1.037	.384%	2.02×10^{-1}	2.02×10^{-1}	.0014%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 4

BETA	T	F_{2M}	F_{2M}*	REL ERR	Z_{MAX}	Z_{MAX}*	REL ERR
.7	.650	1.019	1.017	.196%	1.92×10^{-1}	1.92×10^{-1}	.0007%
.7	.700	1.000	.997	.300%	1.83×10^{-1}	1.83×10^{-1}	.0012%
.7	.750	.982	.980	.204%	1.74×10^{-1}	1.74×10^{-1}	.0005%
.7	.800	.965	.963	.207%	1.66×10^{-1}	1.66×10^{-1}	.0005%
.7	.850	.949	.947	.211%	1.58×10^{-1}	1.58×10^{-1}	.0006%
.7	.900	.934	.932	.214%	1.51×10^{-1}	1.51×10^{-1}	.0007%
.7	.950	.920	.918	.217%	1.44×10^{-1}	1.44×10^{-1}	.0006%
.7	1.000	.906	.905	.110%	1.37×10^{-1}	1.37×10^{-1}	.0004%
.7	1.500	.803	.802	.125%	8.98×10^{-2}	8.98×10^{-2}	.0002%
.7	2.000	.732	.731	.137%	6.12×10^{-2}	6.12×10^{-2}	.0008%
.7	2.500	.680	.678	.294%	4.30×10^{-2}	4.30×10^{-2}	.0029%
.7	3.000	.639	.637	.313%	3.09×10^{-2}	3.09×10^{-2}	.0039%
.7	3.500	.606	.604	.330%	2.27×10^{-2}	2.27×10^{-2}	.0039%
.7	4.000	.578	.576	.346%	1.69×10^{-2}	1.69×10^{-2}	.0053%
.7	4.500	.555	.552	.541%	1.27×10^{-2}	1.27×10^{-2}	.0075%
.7	5.000	.534	.531	.562%	9.68×10^{-3}	9.68×10^{-3}	.0115%
.7	6.000	.500	.497	.600%	5.78×10^{-3}	5.78×10^{-3}	.0116%
.7	7.000	.472	.470	.424%	3.56×10^{-3}	3.56×10^{-3}	.0085%
.7	8.000	.449	.448	.223%	2.24×10^{-3}	2.24×10^{-3}	.0031%
.7	9.000	.430	.429	.233%	1.45×10^{-3}	1.45×10^{-3}	.0012%
.7	10.000	.413	.412	.242%	9.49×10^{-4}	9.49×10^{-4}	.0028%
.7	12.000	.385	.385	.000%	4.28×10^{-4}	4.28×10^{-4}	.0000%
.7	14.000	.363	.364	.275%	2.03×10^{-4}	2.03×10^{-4}	.0043%
.7	16.000	.345	.346	.290%	9.99×10^{-5}	9.99×10^{-5}	.0085%
.7	18.000	.329	.330	.304%	5.09×10^{-5}	5.09×10^{-5}	.0021%
.7	20.000	.316	.317	.316%	2.67×10^{-5}	2.67×10^{-5}	.0069%
.7	22.000	.304	.305	.329%	1.44×10^{-5}	1.44×10^{-5}	.0004%
.7	24.000	.294	.295	.340%	7.89×10^{-6}	7.89×10^{-6}	.0055%
.7	26.000	.285	.286	.351%	4.42×10^{-6}	4.42×10^{-6}	.0094%
.7	28.000	.277	.277	.000%	2.52×10^{-6}	2.52×10^{-6}	.0000%
.7	30.000	.269	.269	.000%	1.46×10^{-6}	1.46×10^{-6}	.0000%
.7	32.000	.263	.262	.380%	8.58×10^{-7}	8.58×10^{-7}	.0025%
.7	34.000	.256	.256	.000%	5.11×10^{-7}	5.11×10^{-7}	.0000%
.7	36.000	.251	.250	.398%	3.08×10^{-7}	3.08×10^{-7}	.0020%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 5

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.8	.001	1.540	1.532	.519%	4.28×10^{-1}	4.28×10^{-1}	.0019%
.8	.002	1.539	1.542	.195%	4.28×10^{-1}	4.28×10^{-1}	.0003%
.8	.003	1.537	1.533	.260%	4.27×10^{-1}	4.27×10^{-1}	.0004%
.8	.004	1.535	1.528	.456%	4.26×10^{-1}	4.26×10^{-1}	.0013%
.8	.006	1.531	1.523	.523%	4.25×10^{-1}	4.25×10^{-1}	.0019%
.8	.008	1.528	1.520	.524%	4.24×10^{-1}	4.24×10^{-1}	.0017%
.8	.010	1.524	1.518	.394%	4.22×10^{-1}	4.22×10^{-1}	.0011%
.8	.015	1.515	1.513	.132%	4.19×10^{-1}	4.19×10^{-1}	.0002%
.8	.020	1.507	1.506	.066%	4.16×10^{-1}	4.16×10^{-1}	.0000%
.8	.025	1.499	1.498	.067%	4.13×10^{-1}	4.13×10^{-1}	.0000%
.8	.030	1.491	1.490	.067%	4.10×10^{-1}	4.10×10^{-1}	.0000%
.8	.035	1.483	1.482	.067%	4.07×10^{-1}	4.07×10^{-1}	.0000%
.8	.040	1.475	1.474	.068%	4.04×10^{-1}	4.04×10^{-1}	.0000%
.8	.045	1.468	1.467	.068%	4.01×10^{-1}	4.01×10^{-1}	.0000%
.8	.050	1.460	1.459	.068%	3.98×10^{-1}	3.98×10^{-1}	.0001%
.8	.055	1.453	1.451	.138%	3.95×10^{-1}	3.95×10^{-1}	.0002%
.8	.060	1.446	1.444	.138%	3.92×10^{-1}	3.92×10^{-1}	.0002%
.8	.065	1.439	1.436	.208%	3.89×10^{-1}	3.89×10^{-1}	.0004%
.8	.070	1.432	1.429	.209%	3.87×10^{-1}	3.87×10^{-1}	.0004%
.8	.075	1.426	1.422	.281%	3.84×10^{-1}	3.84×10^{-1}	.0006%
.8	.080	1.419	1.415	.282%	3.81×10^{-1}	3.81×10^{-1}	.0008%
.8	.085	1.413	1.408	.354%	3.78×10^{-1}	3.78×10^{-1}	.0010%
.8	.090	1.407	1.402	.355%	3.76×10^{-1}	3.76×10^{-1}	.0010%
.8	.095	1.401	1.395	.428%	3.73×10^{-1}	3.73×10^{-1}	.0014%
.8	.100	1.395	1.389	.430%	3.71×10^{-1}	3.71×10^{-1}	.0014%
.8	.150	1.341	1.333	.597%	3.46×10^{-1}	3.46×10^{-1}	.0029%
.8	.200	1.294	1.287	.541%	3.24×10^{-1}	3.24×10^{-1}	.0032%
.8	.250	1.254	1.247	.558%	3.04×10^{-1}	3.04×10^{-1}	.0035%
.8	.300	1.219	1.212	.574%	2.86×10^{-1}	2.86×10^{-1}	.0036%
.8	.350	1.187	1.182	.421%	2.69×10^{-1}	2.69×10^{-1}	.0024%
.8	.400	1.159	1.154	.431%	2.54×10^{-1}	2.54×10^{-1}	.0023%
.8	.450	1.133	1.129	.353%	2.40×10^{-1}	2.40×10^{-1}	.0018%
.8	.500	1.110	1.106	.360%	2.27×10^{-1}	2.27×10^{-1}	.0014%
.8	.550	1.088	1.085	.276%	2.14×10^{-1}	2.14×10^{-1}	.0010%
.8	.600	1.068	1.065	.281%	2.03×10^{-1}	2.03×10^{-1}	.0010%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 6

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.8	.650	1.049	1.047	.191%	1.93×10^{-1}	1.93×10^{-1}	.0006%
.8	.700	1.032	1.030	.194%	1.83×10^{-1}	1.83×10^{-1}	.0004%
.8	.750	1.015	1.014	.099%	1.74×10^{-1}	1.74×10^{-1}	.0003%
.8	.800	1.000	.999	.100%	1.65×10^{-1}	1.65×10^{-1}	.0002%
.8	.850	.986	.985	.101%	1.57×10^{-1}	1.57×10^{-1}	.0000%
.8	.900	.972	.971	.103%	1.50×10^{-1}	1.50×10^{-1}	.0001%
.8	.950	.959	.959	.000%	1.43×10^{-1}	1.43×10^{-1}	.0000%
.8	1.000	.947	.947	.000%	1.36×10^{-1}	1.36×10^{-1}	.0000%
.8	1.500	.850	.850	.000%	8.70×10^{-2}	8.70×10^{-2}	.0000%
.8	2.000	.783	.783	.000%	5.79×10^{-2}	5.79×10^{-2}	.0000%
.8	2.500	.733	.732	.136%	3.96×10^{-2}	3.96×10^{-2}	.0002%
.8	3.000	.693	.692	.144%	2.78×10^{-2}	2.78×10^{-2}	.0004%
.8	3.500	.660	.658	.303%	1.98×10^{-2}	1.98×10^{-2}	.0036%
.8	4.000	.632	.630	.316%	1.43×10^{-2}	1.43×10^{-2}	.0059%
.8	4.500	.609	.607	.328%	1.05×10^{-2}	1.05×10^{-2}	.0037%
.8	5.000	.588	.586	.340%	7.80×10^{-3}	7.80×10^{-3}	.0059%
.8	6.000	.554	.551	.542%	4.41×10^{-3}	4.41×10^{-3}	.0104%
.8	7.000	.526	.523	.570%	2.57×10^{-3}	2.57×10^{-3}	.0123%
.8	8.000	.502	.500	.398%	1.54×10^{-3}	1.54×10^{-3}	.0107%
.8	9.000	.482	.481	.207%	9.41×10^{-4}	9.41×10^{-4}	.0038%
.8	10.000	.465	.464	.215%	5.86×10^{-4}	5.86×10^{-4}	.0026%
.8	12.000	.436	.436	.000%	2.38×10^{-4}	2.38×10^{-4}	.0000%
.8	14.000	.413	.413	.000%	1.02×10^{-4}	1.02×10^{-4}	.0000%
.8	16.000	.394	.395	.254%	4.55×10^{-5}	4.55×10^{-5}	.0064%
.8	18.000	.378	.379	.265%	2.11×10^{-5}	2.11×10^{-5}	.0108%
.8	20.000	.364	.365	.275%	1.00×10^{-5}	1.00×10^{-5}	.0130%
.8	22.000	.351	.352	.285%	4.91×10^{-6}	4.91×10^{-6}	.0026%
.8	24.000	.340	.341	.294%	2.46×10^{-6}	2.46×10^{-6}	.0009%
.8	26.000	.331	.331	.000%	1.26×10^{-6}	1.26×10^{-6}	.0000%
.8	28.000	.322	.322	.000%	6.55×10^{-7}	6.55×10^{-7}	.0000%
.8	30.000	.314	.313	.318%	3.47×10^{-7}	3.47×10^{-7}	.0100%
.8	32.000	.307	.306	.326%	1.86×10^{-7}	1.86×10^{-7}	.0016%
.8	34.000	.300	.298	.667%	1.02×10^{-7}	1.02×10^{-7}	.0509%
.8	36.000	.294	.291	1.020%	5.62×10^{-8}	5.61×10^{-8}	.1103%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 7

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.9	.001	1.468	1.461	.477%	4.28×10^{-1}	4.28×10^{-1}	.0021%
.9	.002	1.467	1.471	.273%	4.28×10^{-1}	4.28×10^{-1}	.0006%
.9	.003	1.466	1.464	.136%	4.27×10^{-1}	4.27×10^{-1}	.0001%
.9	.004	1.464	1.459	.342%	4.26×10^{-1}	4.26×10^{-1}	.0011%
.9	.006	1.462	1.456	.410%	4.25×10^{-1}	4.25×10^{-1}	.0013%
.9	.008	1.459	1.454	.343%	4.24×10^{-1}	4.24×10^{-1}	.0011%
.9	.010	1.457	1.453	.275%	4.23×10^{-1}	4.23×10^{-1}	.0005%
.9	.015	1.450	1.449	.069%	4.20×10^{-1}	4.20×10^{-1}	.0001%
.9	.020	1.444	1.445	.069%	4.17×10^{-1}	4.17×10^{-1}	.0000%
.9	.025	1.438	1.440	.139%	4.14×10^{-1}	4.14×10^{-1}	.0001%
.9	.030	1.432	1.434	.140%	4.11×10^{-1}	4.11×10^{-1}	.0001%
.9	.035	1.426	1.428	.140%	4.08×10^{-1}	4.08×10^{-1}	.0001%
.9	.040	1.421	1.423	.141%	4.05×10^{-1}	4.05×10^{-1}	.0002%
.9	.045	1.415	1.417	.141%	4.02×10^{-1}	4.02×10^{-1}	.0002%
.9	.050	1.409	1.411	.142%	3.99×10^{-1}	3.99×10^{-1}	.0001%
.9	.055	1.404	1.405	.071%	3.96×10^{-1}	3.96×10^{-1}	.0000%
.9	.060	1.399	1.400	.071%	3.94×10^{-1}	3.94×10^{-1}	.0001%
.9	.065	1.393	1.394	.072%	3.91×10^{-1}	3.91×10^{-1}	.0000%
.9	.070	1.388	1.389	.072%	3.88×10^{-1}	3.88×10^{-1}	.0000%
.9	.075	1.383	1.383	.000%	3.85×10^{-1}	3.85×10^{-1}	.0000%
.9	.080	1.378	1.378	.000%	3.83×10^{-1}	3.83×10^{-1}	.0000%
.9	.085	1.373	1.373	.000%	3.80×10^{-1}	3.80×10^{-1}	.0000%
.9	.090	1.369	1.368	.073%	3.78×10^{-1}	3.78×10^{-1}	.0000%
.9	.095	1.364	1.363	.073%	3.75×10^{-1}	3.75×10^{-1}	.0000%
.9	.100	1.359	1.358	.074%	3.72×10^{-1}	3.72×10^{-1}	.0001%
.9	.150	1.316	1.314	.152%	3.48×10^{-1}	3.48×10^{-1}	.0003%
.9	.200	1.279	1.276	.235%	3.26×10^{-1}	3.26×10^{-1}	.0007%
.9	.250	1.246	1.243	.241%	3.07×10^{-1}	3.07×10^{-1}	.0007%
.9	.300	1.216	1.214	.164%	2.88×10^{-1}	2.88×10^{-1}	.0005%
.9	.350	1.190	1.188	.168%	2.71×10^{-1}	2.71×10^{-1}	.0003%
.9	.400	1.166	1.164	.172%	2.56×10^{-1}	2.56×10^{-1}	.0002%
.9	.450	1.143	1.143	.000%	2.42×10^{-1}	2.42×10^{-1}	.0000%
.9	.500	1.123	1.123	.000%	2.28×10^{-1}	2.28×10^{-1}	.0000%
.9	.550	1.104	1.104	.000%	2.16×10^{-1}	2.16×10^{-1}	.0000%
.9	.600	1.086	1.087	.092%	2.04×10^{-1}	2.04×10^{-1}	.0001%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 8

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.9	.650	1.069	1.070	.094%	1.94×10^{-1}	1.94×10^{-1}	.0000%
.9	.700	1.054	1.055	.095%	1.84×10^{-1}	1.84×10^{-1}	.0002%
.9	.750	1.039	1.041	.192%	1.74×10^{-1}	1.74×10^{-1}	.0005%
.9	.800	1.025	1.027	.195%	1.66×10^{-1}	1.66×10^{-1}	.0004%
.9	.850	1.012	1.014	.198%	1.57×10^{-1}	1.57×10^{-1}	.0005%
.9	.900	1.000	1.002	.200%	1.50×10^{-1}	1.50×10^{-1}	.0008%
.9	.950	.988	.991	.304%	1.42×10^{-1}	1.42×10^{-1}	.0017%
.9	1.000	.977	.979	.205%	1.35×10^{-1}	1.35×10^{-1}	.0009%
.9	1.500	.888	.890	.225%	8.51×10^{-2}	8.51×10^{-2}	.0020%
.9	2.000	.824	.826	.243%	5.55×10^{-2}	5.55×10^{-2}	.0013%
.9	2.500	.776	.777	.129%	3.72×10^{-2}	3.72×10^{-2}	.0004%
.9	3.000	.738	.738	.000%	2.55×10^{-2}	2.55×10^{-2}	.0000%
.9	3.500	.706	.705	.142%	1.78×10^{-2}	1.78×10^{-2}	.0005%
.9	4.000	.679	.678	.147%	1.26×10^{-2}	1.26×10^{-2}	.0006%
.9	4.500	.656	.654	.305%	9.02×10^{-3}	9.02×10^{-3}	.0023%
.9	5.000	.635	.633	.315%	6.53×10^{-3}	6.53×10^{-3}	.0057%
.9	6.000	.601	.599	.333%	3.52×10^{-3}	3.52×10^{-3}	.0048%
.9	7.000	.573	.571	.349%	1.96×10^{-3}	1.96×10^{-3}	.0056%
.9	8.000	.549	.547	.364%	1.12×10^{-3}	1.12×10^{-3}	.0112%
.9	9.000	.529	.527	.378%	6.53×10^{-4}	6.53×10^{-4}	.0115%
.9	10.000	.512	.510	.391%	3.88×10^{-4}	3.88×10^{-4}	.0067%
.9	12.000	.482	.482	.000%	1.44×10^{-4}	1.44×10^{-4}	.0000%
.9	14.000	.456	.459	.000%	5.62×10^{-5}	5.62×10^{-5}	.0000%
.9	16.000	.439	.439	.000%	2.29×10^{-5}	2.29×10^{-5}	.0000%
.9	18.000	.422	.423	.237%	9.69×10^{-6}	9.68×10^{-6}	.0041%
.9	20.000	.408	.408	.000%	4.23×10^{-6}	4.23×10^{-6}	.0000%
.9	22.000	.395	.396	.253%	1.89×10^{-6}	1.89×10^{-6}	.0106%
.9	24.000	.384	.384	.000%	8.70×10^{-7}	8.70×10^{-7}	.0000%
.9	26.000	.373	.373	.000%	4.08×10^{-7}	4.08×10^{-7}	.0000%
.9	28.000	.364	.364	.000%	1.95×10^{-7}	1.95×10^{-7}	.0000%
.9	30.000	.356	.354	.562%	9.51×10^{-8}	9.51×10^{-8}	.0343%
.9	32.000	.348	.346	.575%	4.71×10^{-8}	4.70×10^{-8}	.0537%
.9	34.000	.341	.338	.880%	2.36×10^{-8}	2.36×10^{-8}	.1234%
.9	36.000	.334	.331	.898%	1.20×10^{-8}	1.20×10^{-8}	.1745%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 9

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.0	.001	1.413	1.408	.354%	4.28×10^{-1}	4.28×10^{-1}	.0014%
1.0	.002	1.412	1.417	.354%	4.28×10^{-1}	4.28×10^{-1}	.0011%
1.0	.003	1.411	1.411	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.0	.004	1.410	1.407	.213%	4.26×10^{-1}	4.26×10^{-1}	.0005%
1.0	.006	1.408	1.404	.284%	4.25×10^{-1}	4.25×10^{-1}	.0009%
1.0	.008	1.406	1.403	.213%	4.24×10^{-1}	4.24×10^{-1}	.0006%
1.0	.010	1.404	1.403	.071%	4.23×10^{-1}	4.23×10^{-1}	.0001%
1.0	.015	1.400	1.400	.000%	4.20×10^{-1}	4.20×10^{-1}	.0000%
1.0	.020	1.395	1.397	.143%	4.17×10^{-1}	4.17×10^{-1}	.0002%
1.0	.025	1.390	1.393	.216%	4.14×10^{-1}	4.14×10^{-1}	.0004%
1.0	.030	1.386	1.389	.216%	4.11×10^{-1}	4.11×10^{-1}	.0006%
1.0	.035	1.381	1.385	.290%	4.08×10^{-1}	4.08×10^{-1}	.0008%
1.0	.040	1.377	1.381	.290%	4.06×10^{-1}	4.06×10^{-1}	.0010%
1.0	.045	1.372	1.376	.292%	4.03×10^{-1}	4.03×10^{-1}	.0007%
1.0	.050	1.368	1.372	.292%	4.00×10^{-1}	4.00×10^{-1}	.0008%
1.0	.055	1.364	1.367	.220%	3.97×10^{-1}	3.97×10^{-1}	.0005%
1.0	.060	1.360	1.363	.221%	3.95×10^{-1}	3.95×10^{-1}	.0006%
1.0	.065	1.356	1.359	.221%	3.92×10^{-1}	3.92×10^{-1}	.0006%
1.0	.070	1.352	1.355	.222%	3.89×10^{-1}	3.89×10^{-1}	.0007%
1.0	.075	1.348	1.351	.223%	3.87×10^{-1}	3.87×10^{-1}	.0007%
1.0	.080	1.344	1.346	.149%	3.84×10^{-1}	3.84×10^{-1}	.0003%
1.0	.085	1.340	1.342	.149%	3.82×10^{-1}	3.82×10^{-1}	.0003%
1.0	.090	1.336	1.338	.150%	3.79×10^{-1}	3.79×10^{-1}	.0002%
1.0	.095	1.332	1.335	.225%	3.76×10^{-1}	3.76×10^{-1}	.0004%
1.0	.100	1.329	1.321	.602%	3.74×10^{-1}	3.74×10^{-1}	.0041%
1.0	.150	1.294	1.295	.077%	3.50×10^{-1}	3.50×10^{-1}	.0001%
1.0	.200	1.264	1.264	.000%	3.29×10^{-1}	3.29×10^{-1}	.0000%
1.0	.250	1.236	1.237	.081%	3.09×10^{-1}	3.09×10^{-1}	.0001%
1.0	.300	1.211	1.212	.083%	2.90×10^{-1}	2.90×10^{-1}	.0001%
1.0	.350	1.188	1.190	.168%	2.73×10^{-1}	2.73×10^{-1}	.0002%
1.0	.400	1.168	1.169	.086%	2.58×10^{-1}	2.58×10^{-1}	.0002%
1.0	.450	1.148	1.150	.174%	2.43×10^{-1}	2.43×10^{-1}	.0004%
1.0	.500	1.130	1.133	.265%	2.30×10^{-1}	2.30×10^{-1}	.0010%
1.0	.550	1.114	1.116	.180%	2.17×10^{-1}	2.17×10^{-1}	.0008%
1.0	.600	1.098	1.101	.273%	2.06×10^{-1}	2.06×10^{-1}	.0014%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 10

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.0	.650	1.083	1.086	.277%	1.95×10^{-1}	1.95×10^{-1}	.0012%
1.0	.700	1.069	1.073	.374%	1.85×10^{-1}	1.84×10^{-1}	.0023%
1.0	.750	1.056	1.060	.379%	1.75×10^{-1}	1.75×10^{-1}	.0026%
1.0	.800	1.044	1.048	.383%	1.66×10^{-1}	1.66×10^{-1}	.0034%
1.0	.850	1.032	1.036	.388%	1.58×10^{-1}	1.58×10^{-1}	.0032%
1.0	.900	1.021	1.025	.392%	1.50×10^{-1}	1.50×10^{-1}	.0038%
1.0	.950	1.010	1.014	.396%	1.42×10^{-1}	1.42×10^{-1}	.0034%
1.0	1.000	1.000	1.004	.400%	1.35×10^{-1}	1.35×10^{-1}	.0040%
1.0	1.500	.917	.921	.436%	8.39×10^{-2}	8.39×10^{-2}	.0045%
1.0	2.000	.858	.861	.350%	5.39×10^{-2}	5.39×10^{-2}	.0041%
1.0	2.500	.812	.814	.246%	3.55×10^{-2}	3.55×10^{-2}	.0016%
1.0	3.000	.775	.776	.129%	2.39×10^{-2}	2.39×10^{-2}	.0001%
1.0	3.500	.745	.745	.000%	1.63×10^{-2}	1.63×10^{-2}	.0000%
1.0	4.000	.719	.718	.139%	1.13×10^{-2}	1.13×10^{-2}	.0000%
1.0	4.500	.696	.695	.144%	7.96×10^{-3}	7.96×10^{-3}	.0007%
1.0	5.000	.676	.674	.296%	5.65×10^{-3}	5.65×10^{-3}	.0043%
1.0	6.000	.642	.640	.312%	2.92×10^{-3}	2.92×10^{-3}	.0067%
1.0	7.000	.614	.612	.326%	1.56×10^{-3}	1.56×10^{-3}	.0103%
1.0	8.000	.591	.589	.338%	8.54×10^{-4}	8.54×10^{-4}	.0086%
1.0	9.000	.571	.569	.350%	4.78×10^{-4}	4.78×10^{-4}	.0090%
1.0	10.000	.553	.552	.181%	2.73×10^{-4}	2.73×10^{-4}	.0049%
1.0	12.000	.524	.523	.191%	9.29×10^{-5}	9.29×10^{-5}	.0030%
1.0	14.000	.500	.500	.000%	3.34×10^{-5}	3.34×10^{-5}	.0000%
1.0	16.000	.480	.480	.000%	1.25×10^{-5}	1.25×10^{-5}	.0000%
1.0	18.000	.463	.463	.000%	4.89×10^{-6}	4.89×10^{-6}	.0000%
1.0	20.000	.448	.448	.000%	1.97×10^{-6}	1.97×10^{-6}	.0000%
1.0	22.000	.435	.435	.000%	8.13×10^{-7}	8.13×10^{-7}	.0000%
1.0	24.000	.423	.423	.000%	3.45×10^{-7}	3.45×10^{-7}	.0000%
1.0	26.000	.413	.412	.242%	1.49×10^{-7}	1.49×10^{-7}	.0070%
1.0	28.000	.403	.402	.248%	6.61×10^{-8}	6.61×10^{-8}	.0187%
1.0	30.000	.395	.393	.506%	2.98×10^{-8}	2.97×10^{-8}	.0324%
1.0	32.000	.387	.384	.775%	1.36×10^{-8}	1.36×10^{-8}	.0952%
1.0	34.000	.379	.376	.792%	6.33×10^{-9}	6.32×10^{-9}	.1587%
1.0	36.000	.373	.368	1.340%	2.99×10^{-9}	2.98×10^{-9}	.3141%

TABLE A: APPROSIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 11

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.1	.001	1.370	1.367	.219%	4.28×10^{-1}	4.28×10^{-1}	.0004%
1.1	.002	1.369	1.374	.365%	4.28×10^{-1}	4.28×10^{-1}	.0017%
1.1	.003	1.368	1.368	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.1	.004	1.367	1.366	.073%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.1	.006	1.366	1.364	.146%	4.25×10^{-1}	4.25×10^{-1}	.0002%
1.1	.008	1.364	1.363	.073%	4.24×10^{-1}	4.24×10^{-1}	.0001%
1.1	.010	1.363	1.362	.073%	4.23×10^{-1}	4.23×10^{-1}	.0000%
1.1	.015	1.359	1.360	.074%	4.20×10^{-1}	4.20×10^{-1}	.0001%
1.1	.020	1.355	1.358	.221%	4.17×10^{-1}	4.17×10^{-1}	.0005%
1.1	.025	1.352	1.355	.222%	4.15×10^{-1}	4.15×10^{-1}	.0008%
1.1	.030	1.348	1.351	.223%	4.12×10^{-1}	4.12×10^{-1}	.0006%
1.1	.035	1.345	1.348	.223%	4.09×10^{-1}	4.09×10^{-1}	.0008%
1.1	.040	1.341	1.345	.298%	4.06×10^{-1}	4.06×10^{-1}	.0011%
1.1	.045	1.338	1.341	.224%	4.04×10^{-1}	4.04×10^{-1}	.0008%
1.1	.050	1.334	1.338	.300%	4.01×10^{-1}	4.01×10^{-1}	.0011%
1.1	.055	1.331	1.334	.225%	3.98×10^{-1}	3.98×10^{-1}	.0008%
1.1	.060	1.327	1.331	.301%	3.96×10^{-1}	3.96×10^{-1}	.0009%
1.1	.065	1.324	1.328	.302%	3.93×10^{-1}	3.93×10^{-1}	.0011%
1.1	.070	1.321	1.324	.227%	3.90×10^{-1}	3.90×10^{-1}	.0007%
1.1	.075	1.318	1.321	.228%	3.88×10^{-1}	3.88×10^{-1}	.0008%
1.1	.080	1.315	1.318	.228%	3.85×10^{-1}	3.85×10^{-1}	.0009%
1.1	.085	1.312	1.314	.152%	3.83×10^{-1}	3.83×10^{-1}	.0005%
1.1	.090	1.308	1.311	.229%	3.80×10^{-1}	3.80×10^{-1}	.0005%
1.1	.095	1.305	1.308	.230%	3.78×10^{-1}	3.78×10^{-1}	.0005%
1.1	.100	1.302	1.305	.230%	3.75×10^{-1}	3.75×10^{-1}	.0006%
1.1	.150	1.274	1.276	.157%	3.52×10^{-1}	3.52×10^{-1}	.0003%
1.1	.200	1.249	1.250	.080%	3.30×10^{-1}	3.30×10^{-1}	.0002%
1.1	.250	1.226	1.227	.082%	3.11×10^{-1}	3.11×10^{-1}	.0002%
1.1	.300	1.204	1.206	.166%	2.92×10^{-1}	2.92×10^{-1}	.0003%
1.1	.350	1.185	1.187	.169%	2.75×10^{-1}	2.75×10^{-1}	.0006%
1.1	.400	1.167	1.169	.171%	2.60×10^{-1}	2.60×10^{-1}	.0007%
1.1	.450	1.150	1.152	.174%	2.45×10^{-1}	2.45×10^{-1}	.0006%
1.1	.500	1.134	1.137	.265%	2.31×10^{-1}	2.31×10^{-1}	.0011%
1.1	.550	1.120	1.122	.179%	2.19×10^{-1}	2.19×10^{-1}	.0010%
1.1	.600	1.106	1.109	.271%	2.07×10^{-1}	2.07×10^{-1}	.0019%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 12

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.1	.650	1.093	1.096	.274%	1.96×10^{-1}	1.96×10^{-1}	.0021%
1.1	.700	1.080	1.084	.370%	1.85×10^{-1}	1.85×10^{-1}	.0028%
1.1	.750	1.069	1.072	.281%	1.76×10^{-1}	1.76×10^{-1}	.0025%
1.1	.800	1.057	1.061	.378%	1.67×10^{-1}	1.67×10^{-1}	.0030%
1.1	.850	1.047	1.050	.287%	1.58×10^{-1}	1.58×10^{-1}	.0025%
1.1	.900	1.037	1.040	.289%	1.50×10^{-1}	1.50×10^{-1}	.0029%
1.1	.950	1.027	1.031	.389%	1.43×10^{-1}	1.43×10^{-1}	.0045%
1.1	1.000	1.018	1.021	.295%	1.35×10^{-1}	1.35×10^{-1}	.0032%
1.1	1.500	.941	.945	.425%	8.31×10^{-2}	8.31×10^{-2}	.0048%
1.1	2.000	.886	.889	.339%	5.27×10^{-2}	5.27×10^{-2}	.0049%
1.1	2.500	.843	.845	.237%	3.42×10^{-2}	3.42×10^{-2}	.0036%
1.1	3.000	.807	.808	.124%	2.26×10^{-2}	2.26×10^{-2}	.0001%
1.1	3.500	.778	.778	.000%	1.52×10^{-2}	1.52×10^{-2}	.0000%
1.1	4.000	.753	.752	.133%	1.04×10^{-2}	1.04×10^{-2}	.0003%
1.1	4.500	.731	.730	.137%	7.17×10^{-3}	7.17×10^{-3}	.0004%
1.1	5.000	.711	.710	.141%	5.00×10^{-3}	5.00×10^{-3}	.0020%
1.1	6.000	.678	.677	.147%	2.50×10^{-3}	2.50×10^{-3}	.0024%
1.1	7.000	.651	.649	.307%	1.29×10^{-3}	1.29×10^{-3}	.0079%
1.1	8.000	.628	.626	.318%	6.79×10^{-4}	6.79×10^{-4}	.0089%
1.1	9.000	.608	.606	.329%	3.66×10^{-4}	3.66×10^{-4}	.0115%
1.1	10.000	.591	.589	.338%	2.01×10^{-4}	2.01×10^{-4}	.0080%
1.1	12.000	.561	.560	.178%	6.36×10^{-5}	6.36×10^{-5}	.0065%
1.1	14.000	.537	.537	.000%	2.12×10^{-5}	2.12×10^{-5}	.0000%
1.1	16.000	.517	.517	.000%	7.39×10^{-6}	7.39×10^{-6}	.0000%
1.1	18.000	.500	.500	.000%	2.67×10^{-6}	2.67×10^{-6}	.0000%
1.1	20.000	.485	.485	.000%	9.98×10^{-7}	9.98×10^{-7}	.0000%
1.1	22.000	.472	.472	.000%	3.83×10^{-7}	3.83×10^{-7}	.0000%
1.1	24.000	.460	.460	.000%	1.51×10^{-7}	1.51×10^{-7}	.0000%
1.1	26.000	.449	.449	.000%	6.08×10^{-8}	6.08×10^{-8}	.0000%
1.1	28.000	.440	.439	.227%	2.50×10^{-8}	2.50×10^{-8}	.0043%
1.1	30.000	.431	.429	.464%	1.05×10^{-8}	1.05×10^{-8}	.0401%
1.1	32.000	.423	.420	.709%	4.46×10^{-9}	4.46×10^{-9}	.0932%
1.1	34.000	.415	.412	.723%	1.93×10^{-9}	1.93×10^{-9}	.1405%
1.1	36.000	.408	.404	.980%	8.47×10^{-10}	8.45×10^{-10}	.2638%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 13

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.2	.001	1.334	1.333	.075%	4.28×10^{-1}	4.28×10^{-1}	.0001%
1.2	.002	1.334	1.338	.300%	4.28×10^{-1}	4.28×10^{-1}	.0015%
1.2	.003	1.333	1.334	.075%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.2	.004	1.332	1.331	.075%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.2	.006	1.331	1.330	.075%	4.25×10^{-1}	4.25×10^{-1}	.0001%
1.2	.008	1.330	1.329	.075%	4.24×10^{-1}	4.24×10^{-1}	.0001%
1.2	.010	1.329	1.328	.075%	4.23×10^{-1}	4.23×10^{-1}	.0000%
1.2	.015	1.326	1.327	.075%	4.20×10^{-1}	4.20×10^{-1}	.0001%
1.2	.020	1.323	1.324	.076%	4.18×10^{-1}	4.18×10^{-1}	.0001%
1.2	.025	1.320	1.322	.152%	4.15×10^{-1}	4.15×10^{-1}	.0004%
1.2	.030	1.317	1.319	.152%	4.12×10^{-1}	4.12×10^{-1}	.0004%
1.2	.035	1.314	1.316	.152%	4.09×10^{-1}	4.09×10^{-1}	.0003%
1.2	.040	1.311	1.313	.153%	4.07×10^{-1}	4.07×10^{-1}	.0003%
1.2	.045	1.308	1.311	.229%	4.04×10^{-1}	4.04×10^{-1}	.0006%
1.2	.050	1.306	1.308	.153%	4.01×10^{-1}	4.01×10^{-1}	.0005%
1.2	.055	1.303	1.305	.153%	3.99×10^{-1}	3.99×10^{-1}	.0004%
1.2	.060	1.300	1.302	.154%	3.96×10^{-1}	3.96×10^{-1}	.0003%
1.2	.065	1.298	1.299	.077%	3.94×10^{-1}	3.94×10^{-1}	.0002%
1.2	.070	1.295	1.297	.154%	3.91×10^{-1}	3.91×10^{-1}	.0004%
1.2	.075	1.292	1.294	.155%	3.89×10^{-1}	3.89×10^{-1}	.0003%
1.2	.080	1.290	1.291	.078%	3.86×10^{-1}	3.86×10^{-1}	.0001%
1.2	.085	1.287	1.288	.078%	3.84×10^{-1}	3.84×10^{-1}	.0001%
1.2	.090	1.285	1.286	.078%	3.81×10^{-1}	3.81×10^{-1}	.0002%
1.2	.095	1.282	1.283	.078%	3.79×10^{-1}	3.79×10^{-1}	.0001%
1.2	.100	1.280	1.281	.078%	3.76×10^{-1}	3.76×10^{-1}	.0002%
1.2	.150	1.256	1.256	.000%	3.53×10^{-1}	3.53×10^{-1}	.0000%
1.2	.200	1.235	1.235	.000%	3.32×10^{-1}	3.32×10^{-1}	.0000%
1.2	.250	1.215	1.215	.000%	3.12×10^{-1}	3.12×10^{-1}	.0000%
1.2	.300	1.197	1.197	.000%	2.94×10^{-1}	2.94×10^{-1}	.0000%
1.2	.350	1.180	1.180	.000%	2.77×10^{-1}	2.77×10^{-1}	.0000%
1.2	.400	1.164	1.165	.086%	2.61×10^{-1}	2.61×10^{-1}	.0000%
1.2	.450	1.150	1.150	.000%	2.47×10^{-1}	2.47×10^{-1}	.0000%
1.2	.500	1.136	1.137	.088%	2.33×10^{-1}	2.33×10^{-1}	.0003%
1.2	.550	1.123	1.124	.089%	2.20×10^{-1}	2.20×10^{-1}	.0003%
1.2	.600	1.110	1.112	.180%	2.08×10^{-1}	2.08×10^{-1}	.0004%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 14

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL. ERR
1.2	.650	1.099	1.100	.091%	1.97×10^{-1}	1.97×10^{-1}	.0003%
1.2	.700	1.088	1.089	.092%	1.86×10^{-1}	1.86×10^{-1}	.0004%
1.2	.750	1.077	1.079	.186%	1.77×10^{-1}	1.77×10^{-1}	.0008%
1.2	.800	1.067	1.069	.187%	1.67×10^{-1}	1.67×10^{-1}	.0009%
1.2	.850	1.057	1.059	.189%	1.59×10^{-1}	1.59×10^{-1}	.0006%
1.2	.900	1.048	1.050	.191%	1.51×10^{-1}	1.51×10^{-1}	.0008%
1.2	.950	1.039	1.042	.289%	1.43×10^{-1}	1.43×10^{-1}	.0019%
1.2	1.000	1.031	1.033	.194%	1.36×10^{-1}	1.36×10^{-1}	.0013%
1.2	1.500	.961	.963	.208%	8.26×10^{-2}	8.26×10^{-2}	.0019%
1.2	2.000	.909	.911	.220%	5.18×10^{-2}	5.18×10^{-2}	.0023%
1.2	2.500	.868	.869	.115%	3.32×10^{-2}	3.32×10^{-2}	.0006%
1.2	3.000	.835	.835	.000%	2.17×10^{-2}	2.17×10^{-2}	.0000%
1.2	3.500	.806	.807	.124%	1.44×10^{-2}	1.44×10^{-2}	.0002%
1.2	4.000	.782	.782	.000%	9.68×10^{-3}	9.68×10^{-3}	.0000%
1.2	4.500	.761	.760	.131%	6.59×10^{-3}	6.59×10^{-3}	.0010%
1.2	5.000	.742	.741	.135%	4.52×10^{-3}	4.52×10^{-3}	.0017%
1.2	6.000	.710	.709	.141%	2.19×10^{-3}	2.19×10^{-3}	.0017%
1.2	7.000	.683	.682	.146%	1.09×10^{-3}	1.09×10^{-3}	.0037%
1.2	8.000	.661	.659	.303%	5.57×10^{-4}	5.57×10^{-4}	.0079%
1.2	9.000	.641	.640	.156%	2.91×10^{-4}	2.91×10^{-4}	.0042%
1.2	10.000	.624	.623	.160%	1.54×10^{-4}	1.54×10^{-4}	.0036%
1.2	12.000	.595	.594	.168%	4.57×10^{-5}	4.57×10^{-5}	.0045%
1.2	14.000	.571	.571	.000%	1.42×10^{-5}	1.42×10^{-5}	.0000%
1.2	16.000	.551	.552	.181%	4.64×10^{-6}	4.64×10^{-6}	.0023%
1.2	18.000	.534	.535	.187%	1.57×10^{-6}	1.57×10^{-6}	.0053%
1.2	20.000	.519	.520	.193%	5.47×10^{-7}	5.47×10^{-7}	.0065%
1.2	22.000	.506	.506	.000%	1.96×10^{-7}	1.96×10^{-7}	.0000%
1.2	24.000	.494	.494	.000%	7.23×10^{-8}	7.23×10^{-8}	.0000%
1.2	26.000	.483	.483	.000%	2.72×10^{-8}	2.72×10^{-8}	.0000%
1.2	28.000	.473	.473	.000%	1.05×10^{-8}	1.05×10^{-8}	.0000%
1.2	30.000	.464	.464	.000%	4.10×10^{-9}	4.10×10^{-9}	.0000%
1.2	32.000	.456	.455	.219%	1.63×10^{-9}	1.63×10^{-9}	.0147%
1.2	34.000	.448	.447	.223%	6.60×10^{-10}	6.60×10^{-10}	.0260%
1.2	36.000	.441	.439	.454%	2.71×10^{-10}	2.71×10^{-10}	.0799%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 15

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.3	.001	1.305	1.305	.000%	4.28×10^{-1}	4.28×10^{-1}	.0000%
1.3	.002	1.305	1.309	.307%	4.28×10^{-1}	4.28×10^{-1}	.0020%
1.3	.003	1.304	1.304	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.3	.004	1.304	1.302	.153%	4.27×10^{-1}	4.27×10^{-1}	.0002%
1.3	.006	1.303	1.301	.153%	4.26×10^{-1}	4.26×10^{-1}	.0002%
1.3	.008	1.302	1.301	.077%	4.24×10^{-1}	4.24×10^{-1}	.0000%
1.3	.010	1.301	1.300	.077%	4.23×10^{-1}	4.23×10^{-1}	.0000%
1.3	.015	1.298	1.298	.000%	4.21×10^{-1}	4.21×10^{-1}	.0000%
1.3	.020	1.296	1.296	.000%	4.18×10^{-1}	4.18×10^{-1}	.0000%
1.3	.025	1.293	1.294	.077%	4.15×10^{-1}	4.15×10^{-1}	.0001%
1.3	.030	1.291	1.291	.000%	4.13×10^{-1}	4.13×10^{-1}	.0000%
1.3	.035	1.288	1.289	.078%	4.10×10^{-1}	4.10×10^{-1}	.0000%
1.3	.040	1.286	1.286	.000%	4.07×10^{-1}	4.07×10^{-1}	.0000%
1.3	.045	1.284	1.284	.000%	4.05×10^{-1}	4.05×10^{-1}	.0000%
1.3	.050	1.282	1.281	.078%	4.02×10^{-1}	4.02×10^{-1}	.0000%
1.3	.055	1.279	1.279	.000%	3.99×10^{-1}	3.99×10^{-1}	.0000%
1.3	.060	1.277	1.276	.078%	3.97×10^{-1}	3.97×10^{-1}	.0001%
1.3	.065	1.275	1.274	.078%	3.94×10^{-1}	3.94×10^{-1}	.0001%
1.3	.070	1.273	1.272	.079%	3.92×10^{-1}	3.92×10^{-1}	.0000%
1.3	.075	1.270	1.269	.079%	3.89×10^{-1}	3.89×10^{-1}	.0002%
1.3	.080	1.268	1.267	.079%	3.87×10^{-1}	3.87×10^{-1}	.0002%
1.3	.085	1.266	1.265	.079%	3.84×10^{-1}	3.84×10^{-1}	.0002%
1.3	.090	1.264	1.263	.079%	3.82×10^{-1}	3.82×10^{-1}	.0001%
1.3	.095	1.262	1.261	.079%	3.80×10^{-1}	3.80×10^{-1}	.0001%
1.3	.100	1.260	1.258	.159%	3.77×10^{-1}	3.77×10^{-1}	.0004%
1.3	.150	1.240	1.238	.161%	3.54×10^{-1}	3.54×10^{-1}	.0006%
1.3	.200	1.222	1.219	.245%	3.33×10^{-1}	3.33×10^{-1}	.0011%
1.3	.250	1.205	1.203	.166%	3.14×10^{-1}	3.14×10^{-1}	.0006%
1.3	.300	1.189	1.187	.168%	2.95×10^{-1}	2.95×10^{-1}	.0008%
1.3	.350	1.175	1.172	.255%	2.78×10^{-1}	2.78×10^{-1}	.0011%
1.3	.400	1.161	1.159	.172%	2.63×10^{-1}	2.63×10^{-1}	.0006%
1.3	.450	1.148	1.146	.174%	2.48×10^{-1}	2.48×10^{-1}	.0007%
1.3	.500	1.136	1.134	.176%	2.34×10^{-1}	2.34×10^{-1}	.0005%
1.3	.550	1.124	1.123	.089%	2.21×10^{-1}	2.21×10^{-1}	.0003%
1.3	.600	1.113	1.112	.090%	2.09×10^{-1}	2.09×10^{-1}	.0003%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 16

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.3	.650	1.103	1.102	.091%	1.98×10^{-1}	1.98×10^{-1}	.0001%
1.3	.700	1.093	1.092	.091%	1.87×10^{-1}	1.87×10^{-1}	.0001%
1.3	.750	1.083	1.083	.000%	1.78×10^{-1}	1.78×10^{-1}	.0000%
1.3	.800	1.074	1.074	.000%	1.68×10^{-1}	1.68×10^{-1}	.0000%
1.3	.850	1.065	1.065	.000%	1.59×10^{-1}	1.59×10^{-1}	.0000%
1.3	.900	1.057	1.057	.000%	1.51×10^{-1}	1.51×10^{-1}	.0000%
1.3	.950	1.049	1.049	.000%	1.43×10^{-1}	1.43×10^{-1}	.0000%
1.3	1.000	1.041	1.041	.000%	1.36×10^{-1}	1.36×10^{-1}	.0000%
1.3	1.500	.977	.977	.000%	8.23×10^{-2}	8.23×10^{-2}	.0000%
1.3	2.000	.928	.929	.108%	5.11×10^{-2}	5.11×10^{-2}	.0004%
1.3	2.500	.890	.890	.000%	3.25×10^{-2}	3.25×10^{-2}	.0000%
1.3	3.000	.858	.858	.000%	2.10×10^{-2}	2.10×10^{-2}	.0000%
1.3	3.500	.831	.831	.000%	1.38×10^{-2}	1.38×10^{-2}	.0000%
1.3	4.000	.808	.807	.124%	9.14×10^{-3}	9.14×10^{-3}	.0004%
1.3	4.500	.787	.787	.000%	6.13×10^{-3}	6.13×10^{-3}	.0000%
1.3	5.000	.769	.768	.130%	4.16×10^{-3}	4.16×10^{-3}	.0017%
1.3	6.000	.738	.737	.136%	1.96×10^{-3}	1.96×10^{-3}	.0018%
1.3	7.000	.712	.711	.140%	9.48×10^{-4}	9.48×10^{-4}	.0027%
1.3	8.000	.690	.689	.145%	4.70×10^{-4}	4.70×10^{-4}	.0029%
1.3	9.000	.671	.670	.149%	2.38×10^{-4}	2.38×10^{-4}	.0024%
1.3	10.000	.654	.654	.000%	1.23×10^{-4}	1.23×10^{-4}	.0000%
1.3	12.000	.626	.625	.160%	3.42×10^{-5}	3.42×10^{-5}	.0000%
1.3	14.000	.602	.602	.000%	1.00×10^{-5}	1.00×10^{-5}	.0000%
1.3	16.000	.582	.583	.172%	3.07×10^{-6}	3.07×10^{-6}	.0039%
1.3	18.000	.565	.566	.177%	9.76×10^{-7}	9.76×10^{-7}	.0059%
1.3	20.000	.550	.551	.182%	3.20×10^{-7}	3.20×10^{-7}	.0064%
1.3	22.000	.537	.538	.186%	1.08×10^{-7}	1.08×10^{-7}	.0118%
1.3	24.000	.525	.526	.190%	3.74×10^{-8}	3.73×10^{-8}	.0116%
1.3	26.000	.514	.515	.195%	1.32×10^{-8}	1.32×10^{-8}	.0083%
1.3	28.000	.504	.505	.198%	4.78×10^{-9}	4.78×10^{-9}	.0050%
1.3	30.000	.495	.496	.202%	1.76×10^{-9}	1.76×10^{-9}	.0054%
1.3	32.000	.487	.487	.000%	6.58×10^{-10}	6.58×10^{-10}	.0000%
1.3	34.000	.479	.479	.000%	2.51×10^{-10}	2.51×10^{-10}	.0000%
1.3	36.000	.472	.472	.000%	9.68×10^{-11}	9.68×10^{-11}	.0000%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 17

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.4	.001	1.280	1.280	.000%	4.28×10^{-1}	4.28×10^{-1}	.0000%
1.4	.002	1.280	1.283	.234%	4.28×10^{-1}	4.28×10^{-1}	.0010%
1.4	.003	1.280	1.279	.078%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.4	.004	1.279	1.278	.078%	4.27×10^{-1}	4.27×10^{-1}	.0002%
1.4	.006	1.278	1.277	.078%	4.26×10^{-1}	4.26×10^{-1}	.0002%
1.4	.008	1.278	1.276	.156%	4.25×10^{-1}	4.25×10^{-1}	.0003%
1.4	.010	1.277	1.276	.078%	4.23×10^{-1}	4.23×10^{-1}	.0001%
1.4	.015	1.275	1.274	.078%	4.21×10^{-1}	4.21×10^{-1}	.0000%
1.4	.020	1.273	1.272	.079%	4.18×10^{-1}	4.18×10^{-1}	.0000%
1.4	.025	1.271	1.270	.079%	4.15×10^{-1}	4.15×10^{-1}	.0000%
1.4	.030	1.269	1.267	.158%	4.13×10^{-1}	4.13×10^{-1}	0003%
1.4	.035	1.267	1.265	.158%	4.10×10^{-1}	4.10×10^{-1}	.0004%
1.4	.040	1.265	1.263	.158%	4.08×10^{-1}	4.08×10^{-1}	.0004%
1.4	.045	1.263	1.261	.158%	4.05×10^{-1}	4.05×10^{-1}	.0004%
1.4	.050	1.261	1.259	.159%	4.02×10^{-1}	4.02×10^{-1}	.0005%
1.4	.055	1.259	1.257	.159%	4.00×10^{-1}	4.00×10^{-1}	.0005%
1.4	.060	1.257	1.255	.159%	3.97×10^{-1}	3.97×10^{-1}	.0006%
1.4	.065	1.255	1.253	.159%	3.95×10^{-1}	3.95×10^{-1}	.0007%
1.4	.070	1.253	1.251	.160%	3.92×10^{-1}	3.92×10^{-1}	.0008%
1.4	.075	1.252	1.249	.240%	3.90×10^{-1}	3.90×10^{-1}	.0009%
1.4	.080	1.250	1.247	.240%	3.88×10^{-1}	3.88×10^{-1}	.0010%
1.4	.085	1.248	1.245	.240%	3.85×10^{-1}	3.85×10^{-1}	.0012%
1.4	.090	1.246	1.243	.241%	3.83×10^{-1}	3.83×10^{-1}	.0014%
1.4	.095	1.244	1.241	.241%	3.80×10^{-1}	3.80×10^{-1}	.0016%
1.4	.100	1.243	1.239	.322%	3.78×10^{-1}	3.78×10^{-1}	.0018%
1.4	.150	1.226	1.222	.326%	3.55×10^{-1}	3.55×10^{-1}	.0021%
1.4	.200	1.210	1.206	.331%	3.34×10^{-1}	3.34×10^{-1}	.0026%
1.4	.250	1.195	1.191	.335%	3.15×10^{-1}	3.15×10^{-1}	.0034%
1.4	.300	1.182	1.178	.338%	2.97×10^{-1}	2.97×10^{-1}	.0026%
1.4	.350	1.169	1.165	.342%	2.80×10^{-1}	2.80×10^{-1}	.0029%
1.4	.400	1.157	1.153	.346%	2.64×10^{-1}	2.64×10^{-1}	.0029%
1.4	.450	1.145	1.142	.262%	2.49×10^{-1}	2.49×10^{-1}	.0023%
1.4	.500	1.134	1.131	.265%	2.35×10^{-1}	2.35×10^{-1}	.0027%
1.4	.550	1.124	1.121	.267%	2.23×10^{-1}	2.23×10^{-1}	.0023%
1.4	.600	1.114	1.112	.180%	2.10×10^{-1}	2.10×10^{-1}	.0013%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 18

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.4	.650	1.105	1.102	.271%	1.99×10^{-1}	1.99×10^{-1}	.0022%
1.4	.700	1.096	1.094	.182%	1.88×10^{-1}	1.88×10^{-1}	.0009%
1.4	.750	1.087	1.085	.184%	1.78×10^{-1}	1.78×10^{-1}	.0015%
1.4	.800	1.079	1.077	.185%	1.69×10^{-1}	1.69×10^{-1}	.0012%
1.4	.850	1.071	1.069	.187%	1.60×10^{-1}	1.60×10^{-1}	.0014%
1.4	.900	1.063	1.062	.094%	1.52×10^{-1}	1.52×10^{-1}	.0006%
1.4	.950	1.056	1.055	.095%	1.44×10^{-1}	1.44×10^{-1}	.0004%
1.4	1.000	1.049	1.048	.095%	1.37×10^{-1}	1.37×10^{-1}	.0004%
1.4	1.500	.989	.989	.000%	8.21×10^{-2}	8.21×10^{-2}	.0000%
1.4	2.000	.944	.944	.000%	5.07×10^{-2}	5.07×10^{-2}	.0000%
1.4	2.500	.908	.908	.000%	3.19×10^{-2}	3.19×10^{-2}	.0000%
1.4	3.000	.878	.878	.000%	2.04×10^{-2}	2.04×10^{-2}	.0000%
1.4	3.500	.852	.852	.000%	1.33×10^{-2}	1.33×10^{-2}	.0000%
1.4	4.000	.830	.830	.000%	8.70×10^{-3}	8.70×10^{-3}	.0000%
1.4	4.500	.810	.810	.000%	5.78×10^{-3}	5.78×10^{-3}	.0000%
1.4	5.000	.793	.792	.126%	3.87×10^{-3}	3.87×10^{-3}	.0009%
1.4	6.000	.763	.762	.131%	1.78×10^{-3}	1.78×10^{-3}	.0010%
1.4	7.000	.738	.737	.136%	8.40×10^{-4}	8.40×10^{-4}	.0007%
1.4	8.000	.716	.716	.000%	4.06×10^{-4}	4.06×10^{-4}	.0000%
1.4	9.000	.698	.697	.143%	2.00×10^{-4}	2.00×10^{-4}	.0000%
1.4	10.000	.681	.681	.000%	1.01×10^{-4}	1.01×10^{-4}	.0000%
1.4	12.000	.653	.653	.000%	2.65×10^{-5}	2.65×10^{-5}	.0000%
1.4	14.000	.630	.631	.159%	7.36×10^{-6}	7.36×10^{-6}	.0064%
1.4	16.000	.610	.611	.164%	2.13×10^{-6}	2.13×10^{-6}	.0031%
1.4	18.000	.593	.595	.337%	6.40×10^{-7}	6.40×10^{-7}	.0181%
1.4	20.000	.578	.580	.346%	1.98×10^{-7}	1.98×10^{-7}	.0166%
1.4	22.000	.565	.567	.354%	6.32×10^{-8}	6.32×10^{-8}	.0251%
1.4	24.000	.553	.555	.362%	2.07×10^{-8}	2.07×10^{-8}	.0227%
1.4	26.000	.543	.545	.368%	6.91×10^{-9}	6.90×10^{-9}	.0534%
1.4	28.000	.533	.535	.375%	2.36×10^{-9}	2.35×10^{-9}	.0495%
1.4	30.000	.524	.526	.382%	8.19×10^{-10}	8.19×10^{-10}	.0531%
1.4	32.000	.516	.517	.194%	2.90×10^{-10}	2.90×10^{-10}	.0236%
1.4	34.000	.508	.510	.394%	1.04×10^{-10}	1.04×10^{-10}	.0611%
1.4	36.000	.501	.502	.200%	3.80×10^{-11}	3.80×10^{-11}	.0232%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.5	.001	1.260	1.259	.079%	4.28×10^{-1}	4.28×10^{-1}	.0000%
1.5	.002	1.259	1.262	.238%	4.28×10^{-1}	4.28×10^{-1}	.0011%
1.5	.003	1.259	1.258	.079%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.5	.004	1.259	1.257	.159%	4.27×10^{-1}	4.27×10^{-1}	.0003%
1.5	.006	1.258	1.256	.159%	4.26×10^{-1}	4.26×10^{-1}	.0005%
1.5	.008	1.257	1.256	.080%	4.25×10^{-1}	4.25×10^{-1}	.0002%
1.5	.010	1.256	1.256	.000%	4.24×10^{-1}	4.24×10^{-1}	.0000%
1.5	.015	1.255	1.254	.080%	4.21×10^{-1}	4.21×10^{-1}	.0001%
1.5	.020	1.253	1.252	.080%	4.18×10^{-1}	4.18×10^{-1}	.0001%
1.5	.025	1.251	1.251	.000%	4.16×10^{-1}	4.16×10^{-1}	.0000%
1.5	.030	1.250	1.249	.080%	4.13×10^{-1}	4.13×10^{-1}	.0000%
1.5	.035	1.248	1.247	.080%	4.10×10^{-1}	4.10×10^{-1}	.0001%
1.5	.040	1.246	1.245	.080%	4.08×10^{-1}	4.08×10^{-1}	.0002%
1.5	.045	1.245	1.243	.161%	4.05×10^{-1}	4.05×10^{-1}	.0004%
1.5	.050	1.243	1.241	.161%	4.03×10^{-1}	4.03×10^{-1}	.0006%
1.5	.055	1.241	1.239	.161%	4.00×10^{-1}	4.00×10^{-1}	.0008%
1.5	.060	1.240	1.238	.161%	3.98×10^{-1}	3.98×10^{-1}	.0005%
1.5	.065	1.238	1.236	.162%	3.95×10^{-1}	3.95×10^{-1}	.0007%
1.5	.070	1.237	1.234	.243%	3.93×10^{-1}	3.93×10^{-1}	.0010%
1.5	.075	1.235	1.233	.162%	3.91×10^{-1}	3.91×10^{-1}	.0006%
1.5	.080	1.233	1.231	.162%	3.88×10^{-1}	3.88×10^{-1}	.0009%
1.5	.085	1.232	1.229	.244%	3.86×10^{-1}	3.86×10^{-1}	.0014%
1.5	.090	1.230	1.228	.163%	3.83×10^{-1}	3.83×10^{-1}	.0009%
1.5	.095	1.229	1.226	.244%	3.81×10^{-1}	3.81×10^{-1}	.0013%
1.5	.100	1.227	1.225	.163%	3.79×10^{-1}	3.79×10^{-1}	.0009%
1.5	.150	1.213	1.210	.247%	3.56×10^{-1}	3.56×10^{-1}	.0013%
1.5	.200	1.199	1.196	.250%	3.35×10^{-1}	3.35×10^{-1}	.0019%
1.5	.250	1.186	1.183	.253%	3.16×10^{-1}	3.16×10^{-1}	.0023%
1.5	.300	1.174	1.171	.256%	2.98×10^{-1}	2.98×10^{-1}	.0024%
1.5	.350	1.163	1.160	.258%	2.81×10^{-1}	2.81×10^{-1}	.0021%
1.5	.400	1.152	1.150	.174%	2.65×10^{-1}	2.65×10^{-1}	.0012%
1.5	.450	1.142	1.140	.175%	2.50×10^{-1}	2.50×10^{-1}	.0011%
1.5	.500	1.132	1.130	.177%	2.37×10^{-1}	2.37×10^{-1}	.0014%
1.5	.550	1.123	1.121	.178%	2.24×10^{-1}	2.24×10^{-1}	.0012%
1.5	.600	1.114	1.112	.180%	2.11×10^{-1}	2.11×10^{-1}	.0015%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 20

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.5	.650	1.106	1.104	.181%	2.00×10^{-1}	2.00×10^{-1}	.0009%
1.5	.700	1.098	1.096	.182%	1.89×10^{-1}	1.89×10^{-1}	.0008%
1.5	.750	1.090	1.088	.183%	1.79×10^{-1}	1.79×10^{-1}	.0011%
1.5	.800	1.082	1.081	.092%	1.70×10^{-1}	1.70×10^{-1}	.0006%
1.5	.850	1.075	1.074	.093%	1.61×10^{-1}	1.61×10^{-1}	.0005%
1.5	.900	1.068	1.067	.094%	1.52×10^{-1}	1.52×10^{-1}	.0005%
1.5	.950	1.061	1.060	.094%	1.45×10^{-1}	1.45×10^{-1}	.0007%
1.5	1.000	1.055	1.054	.095%	1.37×10^{-1}	1.37×10^{-1}	.0004%
1.5	1.500	1.000	1.000	.000%	8.21×10^{-2}	8.21×10^{-2}	.0000%
1.5	2.000	.958	.958	.000%	5.03×10^{-2}	5.03×10^{-2}	.0000%
1.5	2.500	.924	.924	.000%	3.15×10^{-2}	3.15×10^{-2}	.0000%
1.5	3.000	.895	.895	.000%	2.00×10^{-2}	2.00×10^{-2}	.0000%
1.5	3.500	.871	.870	.115%	1.28×10^{-2}	1.28×10^{-2}	.0001%
1.5	4.000	.849	.849	.000%	8.36×10^{-3}	8.36×10^{-3}	.0000%
1.5	4.500	.830	.830	.000%	5.49×10^{-3}	5.49×10^{-3}	.0000%
1.5	5.000	.814	.813	.123%	3.64×10^{-3}	3.64×10^{-3}	.0006%
1.5	6.000	.785	.784	.127%	1.64×10^{-3}	1.64×10^{-3}	.0008%
1.5	7.000	.760	.760	.000%	7.57×10^{-4}	7.57×10^{-4}	.0000%
1.5	8.000	.740	.739	.135%	3.58×10^{-4}	3.58×10^{-4}	.0003%
1.5	9.000	.721	.721	.000%	1.72×10^{-4}	1.72×10^{-4}	.0000%
1.5	12.000	.678	.678	.000%	2.12×10^{-5}	2.12×10^{-5}	.0000%
1.5	14.000	.655	.656	.153%	5.59×10^{-6}	5.59×10^{-6}	.0039%
1.5	16.000	.636	.637	.157%	1.54×10^{-6}	1.54×10^{-6}	.0079%
1.5	18.000	.619	.620	.162%	4.39×10^{-7}	4.39×10^{-7}	.0053%
1.5	20.000	.604	.606	.331%	1.29×10^{-7}	1.29×10^{-7}	.0174%
1.5	22.000	.591	.593	.338%	3.91×10^{-8}	3.91×10^{-8}	.0217%
1.5	24.000	.580	.581	.172%	1.21×10^{-8}	1.21×10^{-8}	.0165%
1.5	26.000	.569	.571	.351%	3.85×10^{-9}	3.84×10^{-9}	.0423%
1.5	28.000	.559	.561	.358%	1.24×10^{-9}	1.24×10^{-9}	.0347%
1.5	30.000	.550	.552	.364%	4.10×10^{-10}	4.10×10^{-10}	.0349%
1.5	32.000	.542	.544	.369%	1.38×10^{-10}	1.38×10^{-10}	.0508%
1.5	34.000	.534	.536	.375%	4.69×10^{-11}	4.69×10^{-11}	.0369%
1.5	36.000	.527	.529	.380%	1.62×10^{-11}	1.62×10^{-11}	.0481%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 21

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.6	.001	1.242	1.240	.161%	4.28×10^{-1}	4.28×10^{-1}	.0004%
1.6	.002	1.241	1.244	.242%	4.28×10^{-1}	4.28×10^{-1}	.0012%
1.6	.003	1.241	1.241	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.6	.004	1.241	1.240	.081%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.6	.006	1.240	1.239	.081%	4.26×10^{-1}	4.26×10^{-1}	.0002%
1.6	.008	1.239	1.240	.081%	4.25×10^{-1}	4.25×10^{-1}	.0000%
1.6	.010	1.239	1.240	.081%	4.24×10^{-1}	4.24×10^{-1}	.0002%
1.6	.015	1.237	1.239	.162%	4.21×10^{-1}	4.21×10^{-1}	.0004%
1.6	.020	1.236	1.238	.162%	4.18×10^{-1}	4.18×10^{-1}	.0007%
1.6	.025	1.234	1.237	.243%	4.16×10^{-1}	4.16×10^{-1}	.0011%
1.6	.030	1.233	1.235	.162%	4.13×10^{-1}	4.13×10^{-1}	.0007%
1.6	.035	1.232	1.234	.162%	4.11×10^{-1}	4.11×10^{-1}	.0010%
1.6	.040	1.230	1.233	.244%	4.08×10^{-1}	4.08×10^{-1}	.0014%
1.6	.045	1.229	1.231	.163%	4.06×10^{-1}	4.06×10^{-1}	.0009%
1.6	.050	1.227	1.230	.244%	4.03×10^{-1}	4.03×10^{-1}	.0012%
1.6	.055	1.226	1.228	.163%	4.01×10^{-1}	4.01×10^{-1}	.0008%
1.6	.060	1.225	1.227	.163%	3.98×10^{-1}	3.98×10^{-1}	.0010%
1.6	.065	1.223	1.226	.245%	3.96×10^{-1}	3.96×10^{-1}	.0014%
1.6	.070	1.222	1.224	.164%	3.93×10^{-1}	3.93×10^{-1}	.0009%
1.6	.075	1.220	1.223	.246%	3.91×10^{-1}	3.91×10^{-1}	.0012%
1.6	.080	1.219	1.222	.246%	3.89×10^{-1}	3.89×10^{-1}	.0015%
1.6	.085	1.218	1.220	.164%	3.86×10^{-1}	3.86×10^{-1}	.0009%
1.6	.090	1.216	1.219	.247%	3.84×10^{-1}	3.84×10^{-1}	.0012%
1.6	.095	1.215	1.218	.247%	3.82×10^{-1}	3.82×10^{-1}	.0016%
1.6	.100	1.214	1.217	.247%	3.79×10^{-1}	3.79×10^{-1}	.0019%
1.6	.150	1.201	1.204	.250%	3.57×10^{-1}	3.57×10^{-1}	.0017%
1.6	.200	1.189	1.192	.252%	3.36×10^{-1}	3.36×10^{-1}	.0017%
1.6	.250	1.178	1.181	.255%	3.17×10^{-1}	3.17×10^{-1}	.0021%
1.6	.300	1.167	1.170	.257%	2.99×10^{-1}	2.99×10^{-1}	.0016%
1.6	.350	1.157	1.160	.259%	2.82×10^{-1}	2.82×10^{-1}	.0018%
1.6	.400	1.148	1.150	.174%	2.66×10^{-1}	2.66×10^{-1}	.0014%
1.6	.450	1.139	1.141	.176%	2.52×10^{-1}	2.52×10^{-1}	.0016%
1.6	.500	1.130	1.132	.177%	2.38×10^{-1}	2.38×10^{-1}	.0013%
1.6	.550	1.122	1.124	.178%	2.25×10^{-1}	2.25×10^{-1}	.0018%
1.6	.600	1.114	1.116	.180%	2.12×10^{-1}	2.12×10^{-1}	.0018%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 22

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.6	.650	1.106	1.108	.181%	2.01×10^{-1}	2.01×10^{-1}	.0015%
1.6	.700	1.099	1.101	.182%	1.90×10^{-1}	1.90×10^{-1}	.0020%
1.6	.750	1.091	1.094	.275%	1.80×10^{-1}	1.80×10^{-1}	.0023%
1.6	.800	1.085	1.087	.184%	1.71×10^{-1}	1.71×10^{-1}	.0021%
1.6	.850	1.078	1.080	.186%	1.62×10^{-1}	1.62×10^{-1}	.0015%
1.6	.900	1.072	1.074	.187%	1.53×10^{-1}	1.53×10^{-1}	.0022%
1.6	.950	1.065	1.068	.282%	1.45×10^{-1}	1.45×10^{-1}	.0025%
1.6	1.000	1.060	1.062	.189%	1.38×10^{-1}	1.38×10^{-1}	.0025%
1.6	1.500	1.009	1.010	.099%	8.21×10^{-2}	8.21×10^{-2}	.0010%
1.6	2.000	.969	.970	.103%	5.01×10^{-2}	5.01×10^{-2}	.0006%
1.6	2.500	.937	.938	.107%	3.11×10^{-2}	3.11×10^{-2}	.0010%
1.6	3.000	.910	.910	.000%	1.96×10^{-2}	1.96×10^{-2}	.0000%
1.6	3.500	.887	.887	.000%	1.25×10^{-2}	1.25×10^{-2}	.0000%
1.6	4.000	.866	.866	.000%	8.08×10^{-3}	8.08×10^{-3}	.0000%
1.6	4.500	.848	.848	.000%	5.26×10^{-3}	5.26×10^{-3}	.0000%
1.6	5.000	.832	.832	.000%	3.46×10^{-3}	3.46×10^{-3}	.0000%
1.6	6.000	.804	.804	.000%	1.53×10^{-3}	1.53×10^{-3}	.0000%
1.6	7.000	.781	.780	.128%	6.91×10^{-4}	6.91×10^{-4}	.0011%
1.6	8.000	.761	.760	.131%	3.20×10^{-4}	3.20×10^{-4}	.0001%
1.6	9.000	.743	.742	.135%	1.51×10^{-4}	1.51×10^{-4}	.0020%
1.6	10.000	.727	.726	.138%	7.24×10^{-5}	7.24×10^{-5}	.0043%
1.6	12.000	.700	.700	.000%	1.74×10^{-5}	1.74×10^{-5}	.0000%
1.6	14.000	.678	.677	.147%	4.38×10^{-6}	4.38×10^{-6}	.0057%
1.6	16.000	.659	.658	.152%	1.15×10^{-6}	1.15×10^{-6}	.0072%
1.6	18.000	.643	.642	.156%	3.13×10^{-7}	3.13×10^{-7}	.0025%
1.6	20.000	.628	.627	.159%	8.79×10^{-8}	8.79×10^{-8}	.0106%
1.6	22.000	.615	.614	.163%	2.54×10^{-8}	2.54×10^{-8}	.0134%
1.6	24.000	.604	.602	.331%	7.49×10^{-9}	7.49×10^{-9}	.0255%
1.6	26.000	.593	.592	.169%	2.26×10^{-9}	2.26×10^{-9}	.0131%
1.6	28.000	.584	.582	.342%	6.98×10^{-10}	6.98×10^{-10}	.0224%
1.6	30.000	.575	.573	.348%	2.19×10^{-10}	2.19×10^{-10}	.0305%
1.6	32.000	.566	.564	.353%	7.01×10^{-11}	7.00×10^{-11}	.0737%
1.6	34.000	.559	.556	.537%	2.27×10^{-11}	2.27×10^{-11}	.1090%
1.6	36.000	.552	.549	.543%	7.49×10^{-12}	7.49×10^{-12}	.1068%

TABLE B

SUMMARY OF ACCURACY OF APPROXIMATION OF Z_{max}

β	Maximum Observed Relative Error in Estimation of Z_{max} by Z_{max}*
.6	.0646 %
.7	.0116 %
.8	.1103 %
.9	.1745 %
1.0	.3141 %
1.1	.2638 %
1.2	.0799 %
1.3	.0118 %
1.4	.0611 %
1.5	.0508 %
1.6	.1090 %

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 1

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.833	.010	1.500	1.494	.400%	4.22×10^{-1}	4.22×10^{-1}	.0010%
.833	.015	1.492	1.490	.134%	4.19×10^{-1}	4.19×10^{-1}	.0001%
.833	.020	1.484	1.484	.000%	4.16×10^{-1}	4.16×10^{-1}	.0000%
.833	.025	1.477	1.477	.000%	4.13×10^{-1}	4.13×10^{-1}	.0000%
.833	.030	1.470	1.470	.000%	4.10×10^{-1}	4.10×10^{-1}	.0000%
.833	.035	1.462	1.463	.068%	4.07×10^{-1}	4.07×10^{-1}	.0000%
.833	.040	1.456	1.456	.000%	4.04×10^{-1}	4.04×10^{-1}	.0000%
.833	.045	1.449	1.449	.000%	4.01×10^{-1}	4.01×10^{-1}	.0000%
.833	.050	1.442	1.442	.000%	3.98×10^{-1}	3.98×10^{-1}	.0000%
.833	.055	1.436	1.435	.070%	3.95×10^{-1}	3.95×10^{-1}	.0000%
.833	.060	1.429	1.428	.070%	3.93×10^{-1}	3.93×10^{-1}	.0001%
.833	.065	1.423	1.421	.141%	3.90×10^{-1}	3.90×10^{-1}	.0002%
.833	.070	1.417	1.415	.141%	3.87×10^{-1}	3.87×10^{-1}	.0001%
.833	.075	1.411	1.408	.213%	3.84×10^{-1}	3.84×10^{-1}	.0003%
.833	.080	1.405	1.402	.214%	3.82×10^{-1}	3.82×10^{-1}	.0004%
.833	.085	1.399	1.396	.214%	3.79×10^{-1}	3.79×10^{-1}	.0004%
.833	.090	1.393	1.390	.215%	3.76×10^{-1}	3.76×10^{-1}	.0005%
.833	.095	1.388	1.384	.288%	3.74×10^{-1}	3.74×10^{-1}	.0007%
.833	.100	1.382	1.378	.289%	3.71×10^{-1}	3.71×10^{-1}	.0009%
.833	.150	1.332	1.327	.375%	3.47×10^{-1}	3.47×10^{-1}	.0015%
.833	.200	1.289	1.283	.465%	3.25×10^{-1}	3.25×10^{-1}	.0025%
.833	.300	1.219	1.213	.492%	2.87×10^{-1}	2.87×10^{-1}	.0024%
.833	.350	1.189	1.184	.421%	2.70×10^{-1}	2.70×10^{-1}	.0020%
.833	.400	1.162	1.158	.344%	2.54×10^{-1}	2.54×10^{-1}	.0014%
.833	.450	1.137	1.134	.264%	2.40×10^{-1}	2.40×10^{-1}	.0011%
.833	.500	1.115	1.112	.269%	2.27×10^{-1}	2.27×10^{-1}	.0009%
.833	.550	1.094	1.092	.183%	2.15×10^{-1}	2.15×10^{-1}	.0005%
.833	.600	1.075	1.073	.186%	2.04×10^{-1}	2.04×10^{-1}	.0004%

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 2

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.833	.650	1.057	1.056	.095%	1.93×10^{-1}	1.93×10^{-1}	.0001%
.833	.700	1.040	1.039	.096%	1.83×10^{-1}	1.83×10^{-1}	.0001%
.833	.750	1.024	1.024	.000%	1.74×10^{-1}	1.74×10^{-1}	.0000%
.833	.800	1.009	1.009	.000%	1.65×10^{-1}	1.65×10^{-1}	.0000%
.833	.900	.982	.983	.102%	1.50×10^{-1}	1.50×10^{-1}	.0001%
.833	.950	.970	.970	.000%	1.43×10^{-1}	1.43×10^{-1}	.0000%
.833	1.000	.958	.959	.104%	1.36×10^{-1}	1.36×10^{-1}	.0003%
.833	1.500	.863	.865	.232%	8.63×10^{-2}	8.63×10^{-2}	.0007%
.833	2.000	.798	.798	.000%	5.70×10^{-2}	5.70×10^{-2}	.0000%
.833	2.500	.748	.748	.000%	3.88×10^{-2}	3.88×10^{-2}	.0000%
.833	3.000	.709	.708	.141%	2.69×10^{-2}	2.69×10^{-2}	.0002%
.833	3.500	.676	.675	.148%	1.91×10^{-2}	1.91×10^{-2}	.0011%
.833	4.000	.649	.647	.308%	1.37×10^{-2}	1.37×10^{-2}	.0029%
.833	4.500	.625	.623	.320%	9.96×10^{-3}	9.96×10^{-3}	.0052%
.833	5.000	.605	.602	.496%	7.32×10^{-3}	7.32×10^{-3}	.0081%
.833	6.000	.570	.568	.351%	4.07×10^{-3}	4.07×10^{-3}	.0065%
.833	7.000	.542	.540	.369%	2.34×10^{-3}	2.34×10^{-3}	.0073%
.833	8.000	.518	.517	.193%	1.38×10^{-3}	1.38×10^{-3}	.0045%
.833	9.000	.498	.497	.201%	8.27×10^{-4}	8.27×10^{-4}	.0050%
.833	10.000	.481	.480	.208%	5.07×10^{-4}	5.07×10^{-4}	.0033%
.833	12.000	.452	.452	.000%	2.00×10^{-4}	2.00×10^{-4}	.0000%
.833	14.000	.429	.429	.000%	8.28×10^{-5}	8.28×10^{-5}	.0000%
.833	16.000	.409	.410	.244%	3.58×10^{-5}	3.58×10^{-5}	.0011%
.833	18.000	.393	.394	.254%	1.61×10^{-5}	1.61×10^{-5}	.0073%
.833	20.000	.379	.380	.264%	7.43×10^{-6}	7.43×10^{-6}	.0118%
.833	22.000	.366	.367	.273%	3.53×10^{-6}	3.53×10^{-6}	.0046%
.833	24.000	.355	.356	.282%	1.72×10^{-6}	1.72×10^{-6}	.0065%
.833	26.000	.345	.346	.290%	8.52×10^{-7}	8.52×10^{-7}	.0055%
.833	28.000	.336	.336	.000%	4.31×10^{-7}	4.31×10^{-7}	.0000%
.833	30.000	.328	.327	.305%	2.22×10^{-7}	2.22×10^{-7}	.0161%

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 3

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.875	.010	1.472	1.468	.272%	4.23×10^{-1}	4.23×10^{-1}	.0006%
.875	.015	1.465	1.464	.068%	4.19×10^{-1}	4.19×10^{-1}	.0000%
.875	.020	1.458	1.459	.069%	4.16×10^{-1}	4.16×10^{-1}	.0000%
.875	.025	1.452	1.453	.069%	4.13×10^{-1}	4.13×10^{-1}	.0000%
.875	.030	1.446	1.447	.069%	4.10×10^{-1}	4.10×10^{-1}	.0001%
.875	.035	1.439	1.441	.139%	4.07×10^{-1}	4.07×10^{-1}	.0001%
.875	.040	1.433	1.434	.070%	4.05×10^{-1}	4.05×10^{-1}	.0000%
.875	.045	1.427	1.428	.070%	4.02×10^{-1}	4.02×10^{-1}	.0000%
.875	.050	1.421	1.422	.070%	3.99×10^{-1}	3.99×10^{-1}	.0000%
.875	.055	1.415	1.416	.071%	3.96×10^{-1}	3.96×10^{-1}	.0000%
.875	.060	1.410	1.410	.000%	3.93×10^{-1}	3.93×10^{-1}	.0000%
.875	.065	1.404	1.404	.000%	3.90×10^{-1}	3.90×10^{-1}	.0000%
.875	.070	1.399	1.398	.071%	3.88×10^{-1}	3.88×10^{-1}	.0000%
.875	.075	1.393	1.392	.072%	3.85×10^{-1}	3.85×10^{-1}	.0001%
.875	.080	1.388	1.387	.072%	3.82×10^{-1}	3.82×10^{-1}	.0000%
.875	.085	1.383	1.381	.145%	3.80×10^{-1}	3.80×10^{-1}	.0001%
.875	.090	1.378	1.376	.145%	3.77×10^{-1}	3.77×10^{-1}	.0001%
.875	.095	1.373	1.371	.146%	3.75×10^{-1}	3.75×10^{-1}	.0001%
.875	.100	1.368	1.365	.219%	3.72×10^{-1}	3.72×10^{-1}	.0004%
.875	.150	1.322	1.319	.227%	3.48×10^{-1}	3.48×10^{-1}	.0006%
.875	.200	1.283	1.279	.312%	3.26×10^{-1}	3.26×10^{-1}	.0011%
.875	.250	1.248	1.244	.321%	3.06×10^{-1}	3.06×10^{-1}	.0014%
.875	.300	1.214	1.214	.000%	2.88×10^{-1}	2.88×10^{-1}	.0000%
.875	.350	1.190	1.187	.252%	2.71×10^{-1}	2.71×10^{-1}	.0007%
.875	.400	1.164	1.162	.172%	2.55×10^{-1}	2.55×10^{-1}	.0006%
.875	.450	1.141	1.140	.088%	2.41×10^{-1}	2.41×10^{-1}	.0002%
.875	.500	1.120	1.119	.089%	2.28×10^{-1}	2.28×10^{-1}	.0001%
.875	.550	1.100	1.100	.000%	2.16×10^{-1}	2.16×10^{-1}	.0000%
.875	.600	1.082	1.082	.000%	2.04×10^{-1}	2.04×10^{-1}	.0000%

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS SHEET 4

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
.875	.650	1.065	1.065	.000%	1.93×10^{-1}	1.93×10^{-1}	.0000%
.875	.700	1.049	1.050	.095%	1.83×10^{-1}	1.83×10^{-1}	.0001%
.875	.750	1.034	1.035	.097%	1.74×10^{-1}	1.74×10^{-1}	.0002%
.875	.800	1.020	1.021	.098%	1.65×10^{-1}	1.65×10^{-1}	.0002%
.875	.850	1.006	1.008	.199%	1.57×10^{-1}	1.57×10^{-1}	.0004%
.875	.900	.994	.995	.101%	1.50×10^{-1}	1.50×10^{-1}	.0003%
.875	.950	.982	.983	.102%	1.42×10^{-1}	1.42×10^{-1}	.0004%
.875	1.000	.970	.972	.206%	1.36×10^{-1}	1.36×10^{-1}	.0007%
.875	1.500	.879	.881	.228%	8.55×10^{-2}	8.55×10^{-2}	.0014%
.875	2.000	.815	.816	.123%	5.61×10^{-2}	5.61×10^{-2}	.0007%
.875	2.500	.766	.767	.131%	3.78×10^{-2}	3.78×10^{-2}	.0006%
.875	3.000	.727	.727	.000%	2.60×10^{-2}	2.60×10^{-2}	.0000%
.875	3.500	.695	.694	.144%	1.82×10^{-2}	1.82×10^{-2}	.0009%
.875	4.000	.668	.667	.150%	1.30×10^{-2}	1.30×10^{-2}	.0008%
.875	4.500	.644	.643	.155%	9.34×10^{-3}	9.34×10^{-3}	.0022%
.875	5.000	.624	.622	.321%	6.81×10^{-3}	6.81×10^{-3}	.0051%
.875	6.000	.590	.587	.508%	3.71×10^{-3}	3.71×10^{-3}	.0101%
.875	7.000	.561	.559	.357%	2.09×10^{-3}	2.09×10^{-3}	.0116%
.875	8.000	.538	.536	.372%	1.21×10^{-3}	1.21×10^{-3}	.0089%
.875	9.000	.518	.516	.386%	7.11×10^{-4}	7.11×10^{-4}	.0092%
.875	10.000	.500	.499	.200%	4.28×10^{-4}	4.28×10^{-4}	.0053%
.875	12.000	.471	.471	.000%	1.62×10^{-4}	1.62×10^{-4}	.0000%
.875	14.000	.448	.448	.000%	6.47×10^{-5}	6.47×10^{-5}	.0000%
.875	16.000	.428	.429	.234%	2.70×10^{-5}	2.70×10^{-5}	.0046%
.875	18.000	.411	.412	.243%	1.17×10^{-5}	1.17×10^{-5}	.0011%
.875	20.000	.397	.398	.252%	5.19×10^{-6}	5.19×10^{-6}	.0077%
.875	22.000	.384	.385	.260%	2.38×10^{-6}	2.38×10^{-6}	.0033%
.875	24.000	.373	.374	.268%	1.12×10^{-6}	1.12×10^{-6}	.0086%
.875	26.000	.363	.363	.000%	5.34×10^{-7}	5.34×10^{-7}	.0000%
.875	28.000	.354	.353	.282%	2.61×10^{-7}	2.61×10^{-7}	.0072%
.875	30.000	.345	.344	.290%	1.30×10^{-7}	1.30×10^{-7}	.0252%

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1. Biological Defense Research Laboratories, Dugway, Utah, 84022. Approximations of Downwind Distance for a Given Threat from an Elevated Line Source: I. Domain of Inverse Relationship Between F_2 and Z for Restricted Values of β and Values of T of Thirty or Less, by Michael J. Evans. Technical Memorandum BDRL-TM-72-001, June 1972. UNCLASSIFIED

2. [illegible]